JAPANESE INNOVATION STRATEGY AND THE ACQUISITION OF UK INFORMATION TECHNOLOGY FIRMS

T H W Minshall

Christ's College, Cambridge

A dissertation submitted to the University of Cambridge

for the Degree of Doctor of Philosophy

Cambridge University Engineering Department April 1997

Preface

Except for commonly understood and accepted ideas, or where specific reference is made, the work reported in this dissertation is my own and includes nothing which is the outcome of work done in collaboration. No part of the dissertation has been previously submitted to any university for any degree, diploma or other qualification.

T H W Minshall
Cambridge
April 1997

Acknowledgements

I am particularly grateful to my supervisor, Elizabeth Garnsey, for her guidance and support throughout the course of this research. In addition, thanks are due to Nick Oliver and Hugh Whittaker, and all my colleagues at the Manufacturing and Management Division of the Engineering Department, and at the Judge Institute of Management Studies for their advice and constructive criticism.

On the industry side, my gratitude to the companies in the UK and Japan who agreed to contribute to the contents of this dissertation.

Finally, my thanks to my family, for encouraging me, and to Nicola, for all her support and for applying her new-found skills at proof-reading.

This programme of research was supported by a Postgraduate Training Award (J00 429 332012) from the ESRC.

Table of contents

Table of exhibits

Abbreviations used

Abbreviation	Meaning
AV	Audio & Video
BBC	British Broadcasting Corporation
CC	Compact Cassette
CD-R	Recordable CD-ROM
CD-ROM	Compact Disk - Read Only Memory
CE	Consumer Electronics
CPU	Central Processor Unit
CRT	Cathode Ray Tube
DAT	Digital Audio Tape
DVD	Digital Video Disk
EIAJ	Electronic Industries Association of Japan
EU	European Union
FD	Floppy Disk
FDI	Foreign Direct Investment
IT	Information Technology
JDB	Japan Development Bank
JETRO	Japan External Trade Organisation
JV	Joint Venture
M&A	Mergers and Acquisitions
MITI	Japan's Ministry of International Trade and Industry
MO disk	Magneto-optical disk
NC	Network Computer
OEM	Original Equipment Manufacturer
PC	Personal Computer
PoS	Point-of-Sale
RAM	Random Access Memory
ROM	Read-Only Memory
VCR	Video Cassette Recorder
WWW	World-Wide Web

Chapter 1 Introduction

Introduction to the research

In the late 1980s and early 1990s ownership of a number of UK firms operating in various sectors of the information technology (IT) industry was acquired by Japanese firms. These acquisitions attracted attention for a number of reasons:-

- Until this time, the globalising activities of Japanese firms in this sector had largely centred on the use of joint ventures, minority shareholdings and greenfield developments (*Financial Times* 12/4/88; 20/9/91; Emmott 1992; JETRO 1993).
- Japanese manufacturing firms in general had largely avoided international acquisitions for reasons associated with culture (Kester, 1991), corporate governance (Schlosstein, 1989) and perceived problems with managing non-Japanese (Kish & Vasconcellos, 1993).
- The use of acquisitions for strategic (as opposed to financial) reasons is widely acknowledged to be fraught with difficulty and is regarded as a high risk form of business activity (Cartwright & Cooper, 1990;1992). The percentage of unsuccessfully integrated acquisitions is very high, with various studies putting the percentage of failed acquisitions between 50% and 80% (Kitching, 1967; Meeks, 1977).

Given the relative paucity of previous Japanese acquisition activity in this sector and the difficulty for any firm attempting to implement such a strategy, the acquisition of the UK IT firms raised a wide range of potential areas of research. For example, did these acquisitions represent a new model of Japanese foreign direct investment activity? If so, how had the Japanese overcome their dislike for using acquisition of majority share ownership of non-Japanese firms? Were these acquisitions being carried out for financial or strategic reasons? If so, what were the strategic reasons? Was the use of acquisitions by Japanese manufacturing firms peculiar to those firms operating in the IT sector? Were there specific advantages to acquiring UK firms?

Focus of the research

From the wide range of potential research questions presented by these Japanese

acquisitions, this research focuses upon the building of an understanding of the role of the acquisitions of UK IT firms from the perspective of the Japanese firms' innovation strategy when faced with a changing environment. The dynamic and complex nature of this environment was the result of the conditions of technological uncertainty, rapid change and increasing internationalisation that typified the IT industry in the late 1980s and early 1990s. The aim of the research is to answer the following question:-

How have Japanese firms been able to benefit from the acquisition of UK IT firms to enhance their ability to compete in the complex and dynamic environment of the IT industry?

In order to address such a research question, there is a need for a conceptual framework to assist our understanding of the complex issues which are believed to support the rationale for these acquisitions. As will be seen in later sections, such a framework needs to be developed as examination of the pertinent literature raises a number of incongruities, and fails to reveal an appropriate analytical approach. The focus of this research thus becomes the development of a framework for viewing the rationale for the Japanese acquisitions with respect to the organisational processes within the Japanese firms as well as the changing industrial and competitive environment. The literature is used to provide the basic conceptual constructs which are then combined with the rich contextual evidence of the case study material to provide a structure for addressing the research question.

It is important to state that this is a thesis which falls under the umbrella heading of management studies, rather than industrial economics. The aim here is to enhance our understanding of the role that a particular business process (in this case, corporate acquisitions) can play in the growth strategy of firms attempting to compete within a fast-changing environment driven by emerging technologies.

Exhibit 1.1 shows the basic structure of the thesis.

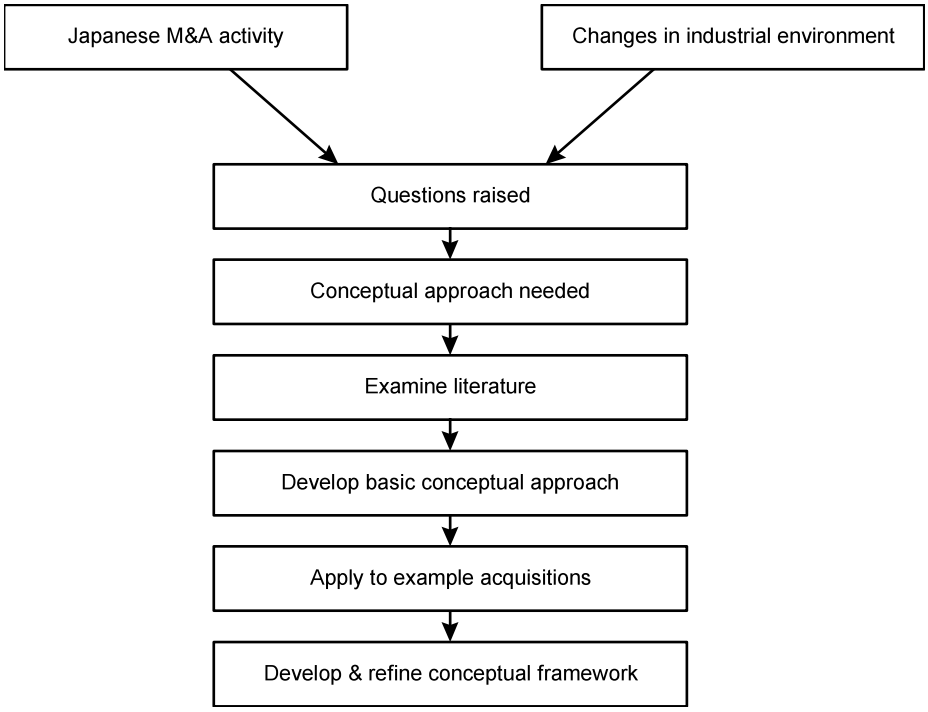


Exhibit 1.1 Basic thesis structure

Background

The issues at the centre of this research need to be examined with reference to certain contexts. These are; (1) the economic setting, in particular the patterns of Japanese foreign direct investment and the growing use of mergers and acquisitions, and (2) changes in the IT industry. Each of these are discussed briefly below to provide the setting for the background to this research.

The economic setting

The acquisitions which form the basis of this research occurred within a number of wider patterns of economic activity.

Boom in Japanese FDI

Firstly, during the second half of the 1980s Japanese foreign direct investment (FDI) was at an all time high and increasing (See Exhibit 1.2) The build-up of cash on Japanese corporate balance sheets caused by the enormous trade surplus (See Exhibit 1.3) and appreciation of the Yen (See Exhibit 1.4) provided Japanese firms with financial strength (as well as the need) to invest internationally.

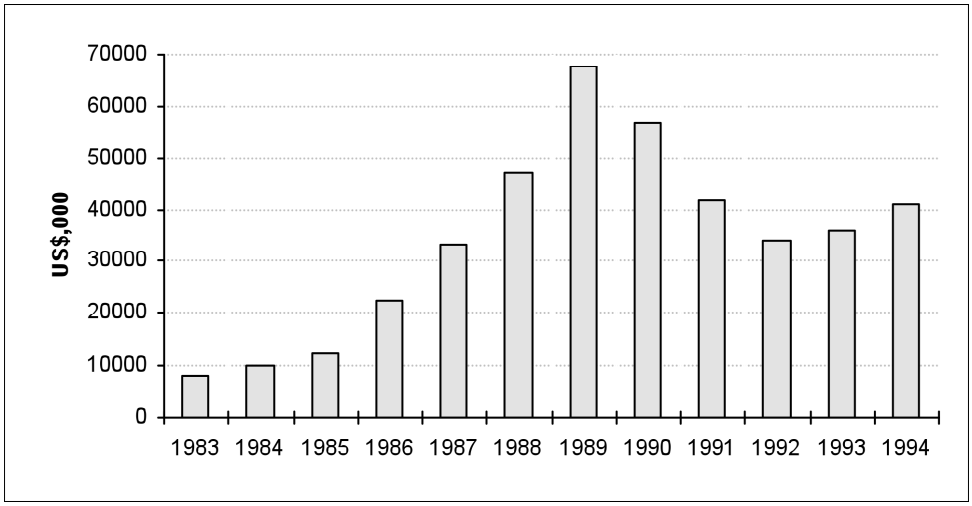


Exhibit 1.2 Japanese FDI activity 1983 - 1994
Source: Data provided by JETRO (London).

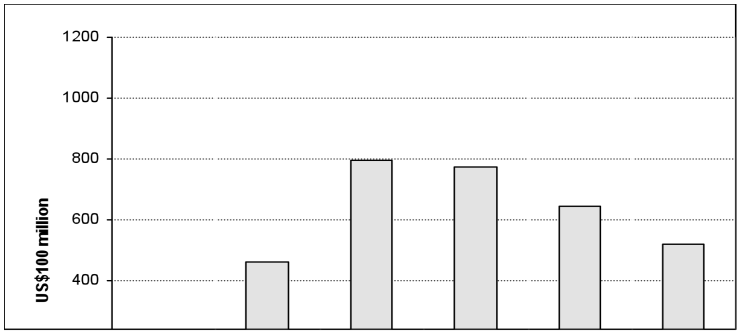


Exhibit 1.3 Japanese trade surplus
Source: Asahi (1994)

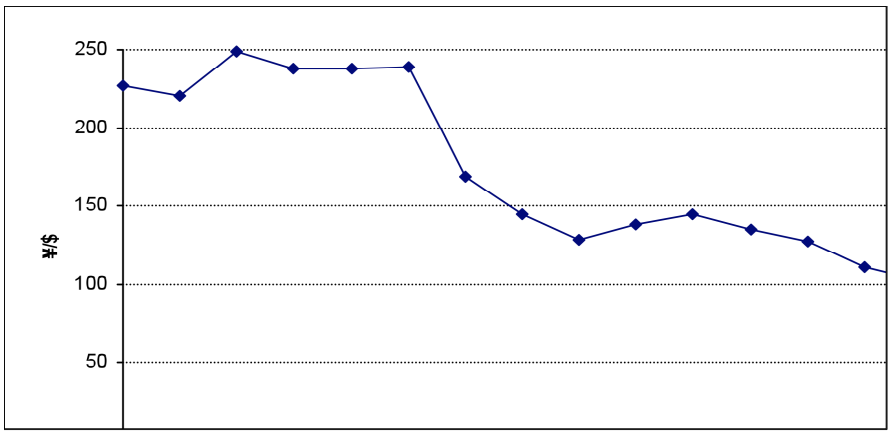


Exhibit 1.4 Yen/dollar exchange rate
Source: Data provided by JETRO (London), and Asahi (1993,4,5)

The motives for Japanese firms in all industries moving overseas can be grouped as follows (Emmott, 1992):-

- *Managerial advantages* - There were advantages to be gained from the combining of low cost factor inputs with Japanese capital, management techniques and product designs.
- *Business obstacles* - Avoidance of the perceived or actual barriers to trade that might be constructed with the formation of trading blocks such as NAFTA and the EU.
- *Attractive dealing opportunities* - With the appreciation of the Yen, foreign assets became increasingly attractive to Japanese firms.
- *Mature markets and intensifying competition* - As markets matured and competition became more complex within international markets, there was a need for a high degree of localisation and customisation of products and services.
- *Local technology* - Firms may need to acquire technology lacking in the parent organisation.
- *Japanese customers* - As firms move overseas, so their suppliers and various service providers (such as banks) will follow them.

The latest wave of world-wide M&A activity

The second component of the wider patterns of economic activity at the time of the Japanese acquisitions was the world-wide boom in merger and acquisition (M&A) activity in the late 1980s. This wave of activity[1] was particularly noticeable in Europe and the US (JETRO, 1993). Coupled with this was an awakening of interest in the use of M&A by Japanese firms both domestically and internationally (Kester, 1991). Up to this time, Japanese firms had largely avoided M&A for reasons which will be discussed in Chapter 3. Fuelled by the integration of global markets and Japanese financial liberation, Japanese firms began to change the way they viewed M&A activity.

[1] Mergers and acquisitions tend to follow distinct 'waves' of activity. The frenzied activity of the mid-, to late-1980s represented the fourth wave of activity to be observed this century (Warshawsky, 1987).

> [..] Japanese business has been experiencing a widening of both the scope and wherewithal for the exercise of managerial discretion in the allocation of corporate resources (Kester, 1991:7).

This change in attitude, coupled with the boom in FDI generally led to a dramatic increase in the level of Japanese 'out-in'[2] M&A activity (See Exhibit 1.5).

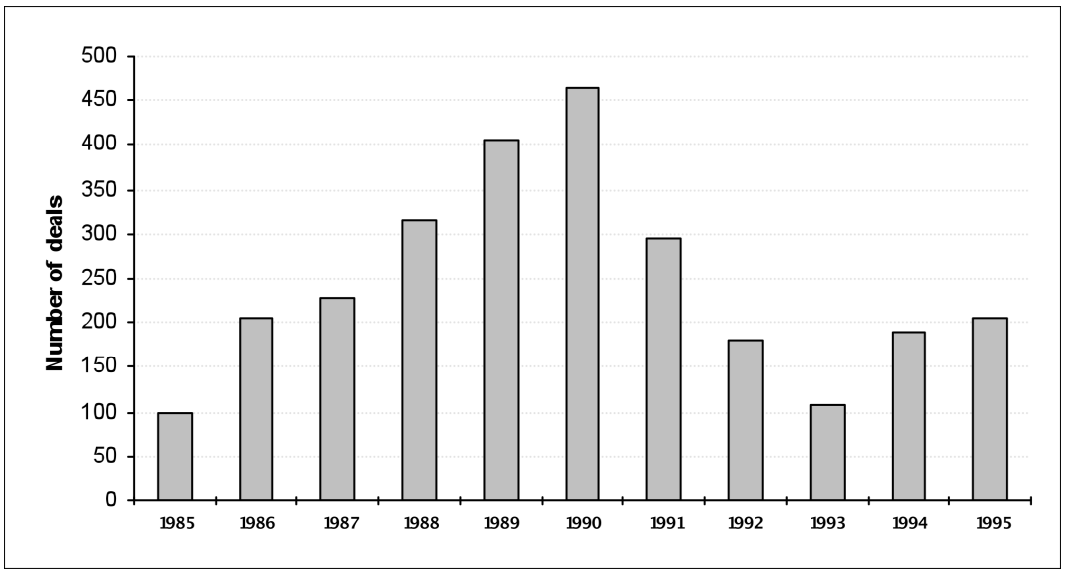


Exhibit 1.5 Japanese overseas M&A activity
Source: Japan M&A Quarterly, 1996

The economic factors identified above illustrate that the acquisitions may simply be considered in terms of the boom in M&A activity world-wide, and in particular, the emergent use of M&A by the cash-rich Japanese firms in the late 1980s and early 1990s. The acquisitions can be considered to have been a result of the economic conditions at that time which made M&A a more favourable option for Japanese firms seeking to globalise their operations. However, the impact of the structural upheavals in the computer industry at this time require us to consider these IT acquisitions from a different perspective to the majority of non-IT related Japanese acquisitions implemented around that time.

Changes in the IT industry

Through the 1980s and into the 1990s, widespread changes were altering the competitive environment of the IT industry. These changes represented the latest in a series of

[2] Japanese firms acquiring non-Japanese firms.

upheavals that had influenced the structure of the industry since its formation some 40 years before.

The 1950s had seen the entry of the data processing computer into the world of commerce, pushed along by IBM with their large, expensive and proprietary *mainframe* computers. A major upheaval came in the 1960s with the development of *minicomputers* which, although still large and expensive systems, provided data processing power to a wider range of users. The 1980s saw the development of *open systems based computing* built around the PC and workstations. These machines made computers available to a much wider number of users and when linked to form client-server networks, transformed the nature of the computer industry. The industry moved from being dominated by a small number of highly vertically integrated producers of large proprietary computer systems, to a large number of initially smaller firms who focused their efforts on particular sectors of the industry. Such sectors included microprocessor design, hardware assembly, operating systems development, application software development and systems integration.

These changes in the computer industry were making themselves felt at the same time as broader changes were affecting many markets and industries. A new competitive environment for firms was being created, driven by three forces: intense international competition; fragmented markets and sophisticated customers; and diversified and transforming technologies (Clark & Fujimoto, 1991). The transforming technologies of the computer industry were thus not only driving the formation of this new competitive environment, but the structure of the computer industry itself was also being influenced by the wider changes.

The nature of the products and services upon which this open systems based 'new' computer industry was built forced changes in the strategy of the computer firms who had grown strong in the 'old', mini-computer and mainframe based computer industry as well as giving chances to new firms to exploit market opportunities. The products of the new industry were typified by four main characteristics:-

- *Open* - Hardware and software from different firms was designed to be used in conjunction with hardware and software from other firms. It was no longer possible for firms to produce products of a proprietary nature and rely on enforced customer loyalty (Morris & Ferguson, 1993).
- *Systemic* - The development of new products from one firm relied heavily on the output of other firms, i.e., products whose success can only be realised in conjunction with related, complementary products (Chesborough & Teece, 1996).
- *Rapidly changing* - As von Braun (1990) has identified, the speed of new product development in many industries was increasing, and this was especially true within the IT industry.
- *International* - As the hardware became more generic in nature and margins narrower, firms required an international presence to be able to reap the economies of scale. In software, the tailoring of products to local demands also required an international presence (Japan Development Bank, 1995).

This 'new' computer industry presented opportunities for start-up firms as well as challenges for those firms who had grown up within the 'old' computer industry. The nature of the products of the new industry to a large extent dictated the organisational form that was required for effective competition, i.e., that they should be open and able to work closely with outside firms, be aware of their position within a systemic industry, able to change rapidly, and to have an international presence. This led to a number of changes within the industry as firms sought to restructure in the face of rapidly changing competitive conditions.

These were the economic and environmental conditions facing the Japanese firms operating in IT-related areas in the late 1980s.

Reported motives for the acquisitions

Content analysis of press archives from around the time of the acquisitions[3] revealed four broad categories of motives for the acquisition of UK IT firms by Japanese firms:-

1. *Market share* - as competition in the market for IT products became increasingly fierce, Japanese firms sought ways of increasing their market share. Acquiring a competing firm was one way to achieve this relatively speedily (*Financial Times*, 18/10/90).

2. *European integration* - with the continued integration of the European Union, set for formalisation in 1992, many non-European firms were keen to gain foothold within 'Fortress Europe' before the market became too closed (*Investor's Chronicle*, 3/8/90).

3. *Acquisition of technology* - for Japanese firms lacking access to a particular technology, acquisition provided one route to internalising the missing technology (*Financial Times*, 30/3/91).

4. *Market entry* - for Japanese firms attempting to enter the highly competitive and fast moving market for IT goods and services, acquisition of a complete 'business infrastructure' provided one means to achieve this (*Asahi News Service*, 12/4/90).

Examination of literature

Examination of the various bodies of academic literature relating to the four categories of motives for acquiring given above revealed that there was a well grounded theoretical rationale underpinning each of them. For example, a firm which lacks a specific technology has a number of options which include: developing the technology internally; licensing the technology from outside; finding a partner to jointly develop the technology; or simply buying a company which has this technology (Granstrand & Sjölander, 1990). It is implied that if a suitable target company can be found, then it is simply a matter of purchasing the majority of shares of this target firm. The technology and knowledge of the acquired firm will then becomes integrated into the parent

[3] Details of the archives used are given in Chapter 5 and also in Appendix II.

organisation.

To counteract this simplistic view, a large body of literature has grown which attempts to highlight the extreme complexity of integrating two organisational cultures and points out the very high rates of failure of acquisitions (e.g., emerging from the work of Kitching, 1967). However, these bodies of literature are based almost exclusively upon the use of acquisitions by non-Japanese firms (Matsuura, 1995). Given the additional problems associated with cross-border acquisitions undertaken by Japanese firms (as detailed by Kester, 1991), it became harder to see why the Japanese firms would choose to use acquisitions over other, more loosely binding strategic alliance options.

For each of the motives detailed in the previous section, there were viable strategic alternatives, such as joint venture partnering, greenfield site development and technology licensing. It remained unclear as to what additional benefit the Japanese firms would obtain through acquisition that would not be more easily gained by some other form of alliance partnering or direct investment. One pointer towards less obvious motives for acquiring can be seen when the wider environmental and industrial changes are examined in more detail.

Wider reaching changes - Beyond the 'new' computer industry

As mentioned earlier, the competitive environment and structure of the IT industry in the late 1980s and early 1990s was undergoing extreme change driven predominantly by transforming technologies:-

- *Internal changes* - At the time of the acquisitions, there were three key trends having a great impact upon the strategies of firms operating within the computer industry. These were; 'downsizing' (as the power of small computers increased, there was a shift in demand among users from large to small computers); 'networking' (the linking of small computers to form networks); and 'open systems' (the emergence of standard architectures which allowed hardware and software from different vendors to work together). At the time of the acquisitions, the influence of these internal changes was being widely felt by all firms operating in the industry. The large

Japanese IT firms in particular were struggling to react to some of these changes

In addition to these internal factors, there were wider changes taking place in a number of related industries. The influence of these changes on the strategies of the Japanese firms was far from clear at the time of the acquisitions:-

- *External changes* - Driven by a combination of technological advances and industry de-regulation, the industries of telecommunications, consumer electronics and IT were converging to create a new competitive environment. The initial impact of this convergence was just beginning to be felt at the time of the Japanese acquisitions. One of the main factors driving the formation of this new competitive environment was the move from analogue to digital core electronic technologies in a wide range of product areas. This was predicted to have the effect of rendering certain barriers between the industries of IT, consumer electronics and telecommunications largely transparent and would lead to the formation of a new industry - the "digital industry" (Hamel & Prahalad, 1994). The formation of the digital industry pointed to the restructuring of the industries of IT, consumer electronics and telecommunications around three basic areas: *devices* (the hardware and components), *content* (everything that is displayed, stored, used and transmitted by the devices), and *distribution* (all means of distributing the content to the devices). This combined industry would present a highly uncertain and rapidly changing competitive environment.

The results of the internal changes within the industry were being widely felt at the time of the acquisitions. These changes represented not only a shift towards a new underpinning group of technologies, but also a change in the structure of the industry itself. The manufacturers of large computers were being forced to acquire skills in the development of small, networked and open computer systems. These large firms were also forced into competition with small firms who were able to access the 'off-the-shelf' components that comprised the core of the small computers, and were able to respond rapidly to the changing demands of consumers.

The effects of the external changes that were predicted to lead to the formation of the

"digital industry" were harder to see. Analysis of news archives at the time of the acquisitions did not reveal issues relating to the convergence of telecommunications, consumer electronics and computing as being perceived as a visible motive for acquiring UK firms.

Yet, it is clear that the competitive environment presented by the digital industry is one which will require firms, particularly those used to operating in more structured, domestically-, and product-focused markets, to learn new skills. Such skills encompass not only knowledge of new technologies, but also organisational skills such as the ability to work with firms from a range of industry sectors. Innovation within this industry requires the ability to access a wide range of resources and skills, coupled with the ability to reconfigure these resources rapidly in response to changing demand and technological advances.

The requirement for an analytical framework

This research aims to examine certain aspects of the behaviour of firms faced with a dynamic and uncertain environment driven by fast emerging technologies. The discussion of the environmental conditions in the lead-up to the acquisitions and the predicted influence of convergence upon the strategies of the firms points to the complexities of the issues under examination. In order to assist in the understanding of why and how the Japanese firms used acquisitions in the early 1990s, it is necessary to have a suitable analytical framework. Such a framework should allow the behaviour of firms to be viewed not only in terms of the changes within the computer industry itself and the need for firms to acquire technologies to respond to that change, but also to view the actions of the firms in terms of the wider issues relating to convergence. For Japanese IT firms, these wider issues represented a potentially dramatic change in the way that they would do business.

The analytical approach should allow us to examine the way in which changing environmental conditions influence the organisational processes within the firms seeking to compete in conditions of change and uncertainty.

The literature emerging from the resource-based view of the firm on competence and capability provides a useful set of components for building such a framework. This literature, though lacking clarity and consistency in its use of terminology and units of analysis, does provide a rich source of theoretical constructs to help us understand the strategies of firms operating in a dynamic environment.

Once developed, the analytical framework will provide a perspective from which to view the research questions which it is hoped will make visible the less apparent motives for, and benefits of, the use of acquisitions by the Japanese firms.

Exhibit 1.6 provides an illustration of the flow of the research and shows the structure of the complete dissertation.

The appendices give further information on the following topics:-

Appendix I: An overview of the Japanese industrial and corporate system.

Appendix II: Details of the case study data acquisition process.

Appendix III: Background details on the case study firms.

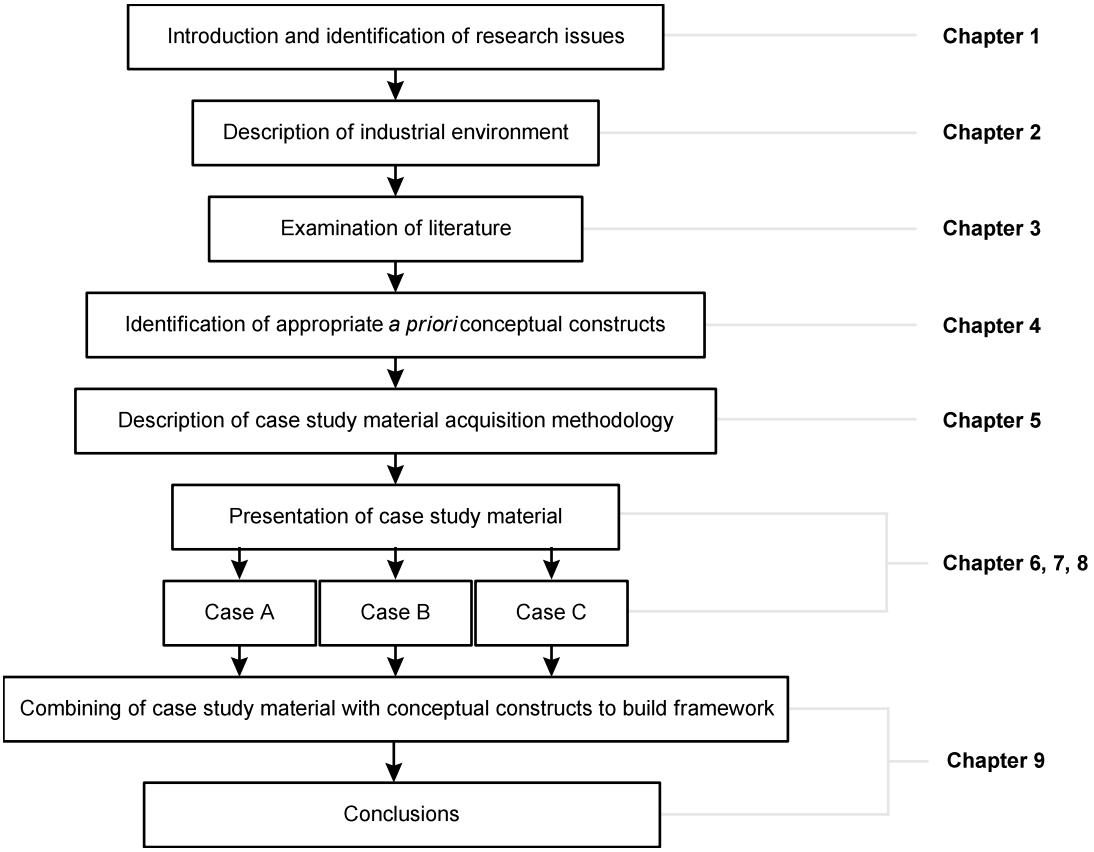


Exhibit 1.6 Detailed thesis structure

Chapter 2 Convergence towards the 'digital industry'

Chapter overview

In this chapter, the aim is to describe the competitive environment that faced firms operating in the IT industry at the time of acquisition, as well as describing the changes that have taken place in the years following up to the time of writing. This chapter provides us with a view of the competitive environment within the IT industry at the time of the acquisitions as well as describing the factors that were contributing to the increasing uncertainty and dynamism of this environment.

This chapter is divided as follows:- Firstly, a short profile is given of the changes that have occurred within the computer industry over the last 20 years and which led to the emergence of open systems based computing. Next, the various factors which have combined with changes in the computer industry to act as catalysts for the formation of a new industry, the 'digital industry', are highlighted. These factors include changes in the telecommunications, consumer electronics and various 'content' providers. The widespread use of alliances within this industry are then discussed, with particular reference to their use by Japanese firms. The final section of the chapter focuses on the generic strengths and weaknesses of Japanese firms attempting to operate within this new competitive environment.

Changes in the computer industry

Until the 1980s, the computer industry was dominated by the producers of large computers. The majority of these machines fitted into one of two broad categories - minicomputers and mainframes. The leading applications for these machines were to assist in the administration of large organisations, and the performing of time consuming calculations. They were usually kept in centralised locations, operated by specialists, and almost invariably ran proprietary operating and application software. Large suppliers dominated the market, and these firms tended to be highly vertically integrated, providing customers with a complete 'package', comprising hardware, software, maintenance and other services (Mills, 1996). As the hardware element of these packages was so

expensive, complicated and proprietary in nature, customers tended to stick with one supplier. Computer firms were content to maintain 'closed' standards for their hardware and software as a method of ensuring customer loyalty (See Exhibit 2.1).

Property	**Closed systems**	**Open systems**
Scalability	Upward and downward scalability limited to models within the vendors own product line.	Scaleable within and across vendor lines supporting similar standards. Customers free to choose among vendors.
Portability	Portability generally limited to moving applications upwards and downwards within a vendor's own product family.	Ability to run software on multiple platforms and easily move applications from one platform to another.
Interoperability	Interoperability between products from differing vendors non-existent.	Systems from different vendors can work together.
Compatibility	Compatibility generally maintained within a product line until architecture of that product is replaced.	Compatibility generally maintained through standards and architectures until replaced.

Exhibit 2.1 Closed versus open systems
Source: Sun Microsystems (1996)

Various factors conspired to form high barriers to entry for firms seeking to enter this market (van der Meer & Gudim, 1992)[4]. These include:-

- *Considerable economies of scale:* The big firms dominated the market, and as their output rose, the average costs of R&D, production, marketing maintenance and other services fell. New firms would not be in such a favourable position.
- *A high degree of product differentiation:* The computer industry was characterised by a degree of enforced system loyalty. This was the result mainly of the software

[4] However, it was possible for firms to gain entry into the market. The emergence of the minicomputer market gave companies such as DEC the opportunity to gain market share in this newly created market segment of the industry. Also, the development of the integrated circuit (IC) saw the start-up of a number of specialist chip developers. As the costs involved in designing and manufacturing ICs was high, firms began providing the computer hardware producers with an external source of processor chips. It was in this way that Intel and Motorola grew within the computer industry.

required to make the hardware run not being portable among systems produced by different manufacturers and in some cases, even among the systems produced by the same manufacturer. The result was known as 'software lock-in', i.e., once a user was committed to a particular manufacturer's computer system, there were high costs involved in switching to a different system.

- *High absolute cost barriers:* These included the cost of capital needed to gain and then maintain market share. Capital requirements were also raised by the large computer firms' policies of 'bundling', i.e., only providing complete systems including hardware, software, maintenance and other services.[5]

A schematic view of the major players within this 'old' computer industry is given in Exhibit 2.2.

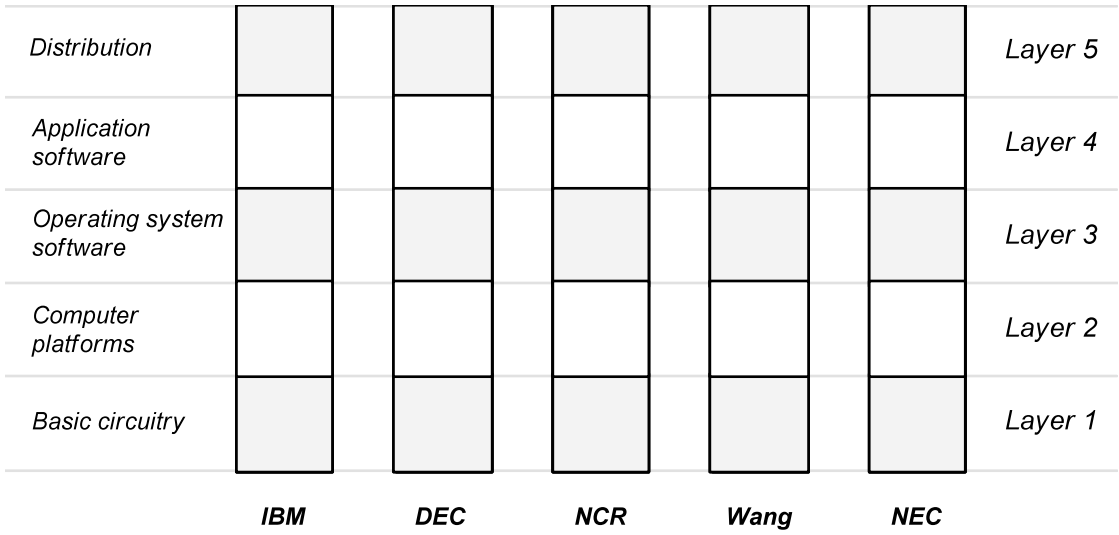


Exhibit 2.2 The key players of the 'old' computer industry
Source: Adapted from Intel (1993)

IBM dominated the 'old' computer industry and by 1980, the US firm had gained 80% of the market for large computers (Gates, 1995). As a large, well-established firm offering a complete range of scaleable computer systems, IBM was the 'safe' solution for providing the computer requirements for most firms. Buyers often lacked the necessary technical

[5] In the case of IBM, these costs were reinforced by the practice of leasing rather than selling computers, thereby increasing the amount of capital required by a new entrant to the market.

expertise to make informed decisions regarding the purchase of computer systems and therefore relied on IBM to make that decision for them (Mills, 1996). Consequently, the buyer's price sensitivity was quite low. In order to obtain a computer system that was perceived as satisfying their business needs, customers were quite willing to pay a premium to a supplier with a reputation for quality (van der Meer & Gudim, 1992). In addition, IBM's practice of leasing computers led to IBM being regarded by many firms as their "partner in data processing and office work" (Mills, 1996).

The development of the PC[6]

The personal computer[7] (PC) emerged from being a hobbyists toy in the 1970s to a high volume commercial product in the 1980s. As these small machines were assembled from 'off-the-shelf' components, there was less requirement for firms producing PCs to be vertically integrated.

The early PCs were relatively simple in structure (though using complex components) and could perform tasks such as word-processing, accounting, organising mailing lists, and playing games. As such, they were ideally suited for small businesses and hobbyist users. Most large computer firms were keen to gain a share of this emerging market[8]. In order to "make its presence known in every area of the computer industry", IBM launched its own PC in 1981 (Chposky & Leonis, 1988). IBM's machine was built around a microprocessor unit from Intel ('8088'), and an operating system from Microsoft ('PC-DOS'). This Intel-Microsoft pattern grew to become the *de facto* standard for the majority of PCs world-wide, although throughout the 1980s, various other

---

[6] Chposky & Leonis (1988), Cringely (1992) and Gates (1995) provide three rather different perspectives on the development of the PC industry. This section draws on the work of each of these authors in order to provide a balanced view.

[7] Categorised at this time as a 'microcomputer', to fit in with the existing classifications of computers. IBM popularised the term 'personal computer' through its marketing activities for its original microcomputer.

[8] Most but not all; notable exceptions were DEC, whose founder repeatedly and publicly dismissed PCs as a "passing fad", and Wang, whose founder saw the potential of these small computers, but failed to understand the importance of their 'openness'. Wang continued to attempt to tie hardware and software together in a proprietary format, and consequently failed in the face of competition from open system providers (Gates, 1995).

computer firms did attempt to push their own competing standards[9].

IBM's success in the PC market, which it regarded as a useful supplement to its large computer businesses drove the company's profits to record levels - $6.6 billion in 1984[10]. More software began to be written for the PCs and this, along with the development of many third-party hardware accessories, acted as a positive feedback force to increase demand for the core hardware. The large computer firms viewed the market for PCs not as a separate market, but as an entry point for small firms who could not yet afford 'mainstream' (i.e., mainframe, or minicomputer) systems, but who one day might.

The majority of mainframe and minicomputer firms did not see the PC as a threat to their core business. However, the design for the *de facto* standard IBM-PC was effectively open[11] - it used standardised interfaces, and any firm could purchase the microprocessor chips from Intel, and license DOS from Microsoft. This allowed other firms, even relatively small ones, to begin producing 'clones' of the IBM-PC. IBM aimed to stay one step ahead of the clone manufacturers by maintaining the technological lead. In 1983, it produced its second generation machine - the PC-XT, and in 1984, the PC-AT. This latter machine, built around Intel's 80286 chip, gave vastly improved performance compared with previous models, and within one year had gained 70% of the PC market (Gates, 1995). The clone producers responded quickly, and price competition became fierce. PCs began to be linked together to form networks, and this, coupled with the improving price:performance ratio of newer PCs and the emergence of key commercial applications (such as the Lotus 1-2-3 spreadsheet and WordStar word-processing programme)

---

[9] By the early 1980s, there were some 200 mutually incompatible types of PC on the market (Chposky & Leonis (1988). Among the more successful of these were those produced by Acorn, Atari, Apple, Commodore, DEC, Eagle, Hewlett Packard, NEC, Northstar and Xerox. Of these, only Apple's Macintosh platform has survived as a competitor for the PC standard on an international level, and until recently, NEC's 9800 platform as a competitor in the Japanese market.

[10] This was due in part to IBM's shift in strategy from generating revenue from renting computer systems to selling them (Mills, 1996).

[11] Within IBM, the responsibility for the design, manufacture and marketing of the PC lay with a 'special operating unit' within IBM called 'Entry Systems'. Rather than relying upon system components designed and manufactured by IBM itself and carefully protecting the design of the overall PC system design, the PC utilised standardised, bought-in components from outside (such as the central processor unit from Intel) which gave the PC an 'open architecture' design. The operating system (DOS) software was licensed from the (then) small software firm of Microsoft, who were free to license DOS to any other firms.

transformed these small computers into powerful business tools.

As the performance of the new PCs improved, the application areas of these small machines began to encroach into business areas previously dominated by the large computer systems (Chposky & Leonis, 1988). IBM's response to this unexpected technological challenge was to develop a new architecture for its next generation of machines, the PS/2, which would be technologically advanced, protected, and incompatible with many PC-AT accessories and software[12]. This, it was hoped, would allow IBM to control the hardware standard, and avoid the PC stealing sales from the business areas of its other divisions. However, this move came too late, as customers had begun to see the potential benefits of having open systems and a wide range of vendors to choose between. Customers did not switch to IBM's new PS/2 system, and the market for the PC-AT compatible machines continued to grow. The rapid growth of the PC, well beyond the expectations of the majority of the established computer firms, caused the structure of the computer industry to change dramatically. Exhibit 2.3 gives a schematic view of this "hot 'new' industry" (Chposky & Leonis, 1988), as centred on the PC.

Within this 'new' industry, the role of standards became critical. The systemic nature of the products required the integrating of components from a wide range of companies, each of which had to conform to standards in order for the products to function. The networks of computers that were being formed relied upon there being standardised formats for the interchange of data and the connecting of components. The acceptance of standards became critical:-

> A small handful of the companies supplying components to the network will define and control the systems critical architectures, for each specific layer of the system. [..] Companies that control proprietary architectural standards have an advantage over other vendors. Since they are usually better positioned to develop products that maximise its capabilities; by modifying the architecture, they can discipline competing product vendors. *In an open system, era, the most consistently successful information technology companies will be the ones who manage to establish a proprietary architectural standard over a substantial competitive space and defend it against the assaults of both*

[12] The development of the PS/2 was carried out in conjunction with the development of a new operating system to replace MS-DOS - OS/2.

clones and rival architectural sponsors (Morris & Ferguson, 1993:88-89. Emphasis added).

Distribution	*Computer dealer, direct sales, consumer electronics stores*	*Layer 5*
Application software (e.g. Internet browsers)	*Internet Explorer (Microsoft), Netscape Navigator (Netscape)*	*Layer 4*
Operating system software	*Client: DOS (Microsoft), Windows (Microsoft), MacOS (Apple)* *Server: MSN (Microsoft), NetWare (Novell)*	*Layer 3*
Computer platforms	*IBM-PC compatible (Compaq), Power Macintosh (Apple)*	*Layer 2*
Microprocessor	*CISC (Intel), RISC (Motorola)*	*Layer 1*

( ) = Example firm

Exhibit 2.3 The 'new' computer industry (based around the PC market)
Source: Adapted from Intel (1993)

The emergence of the more user-friendly 'graphical-user interface'[13] coupled with increased processing power and emerging 'multimedia'[14] applications pushed up the demand for PCs for home use. This has fuelled demand for PCs which is predicted to continue well into the next millennium (See Exhibit 2.4).

This growth is affecting the producers of all components within the PC 'foodchain', from disk drives to monitors, and memory chips to microprocessors[15]. The market has become extremely dynamic, as customers become more familiar with computers and more exacting in their demands for high performance machines at low cost.

[13] Instead of relying on typed commands, graphical user interfaces (GUI) allow the user to control the functions of the computer by positioning a cursor on the screen guided by the movements of a input device - a 'mouse'. This system was pioneered by Xerox, and made a commercial success by Apple with the Macintosh operating system, and Microsoft with the Windows operating system.

[14] Broadly defined by JETRO (1994) as being "the integration of different information such as graphics, text, sound and computer data, and the ability to show, or play it simultaneously".

[15] Tapscott and Caston (1993) describe in more detail the core technologies that make up this PC foodchain.

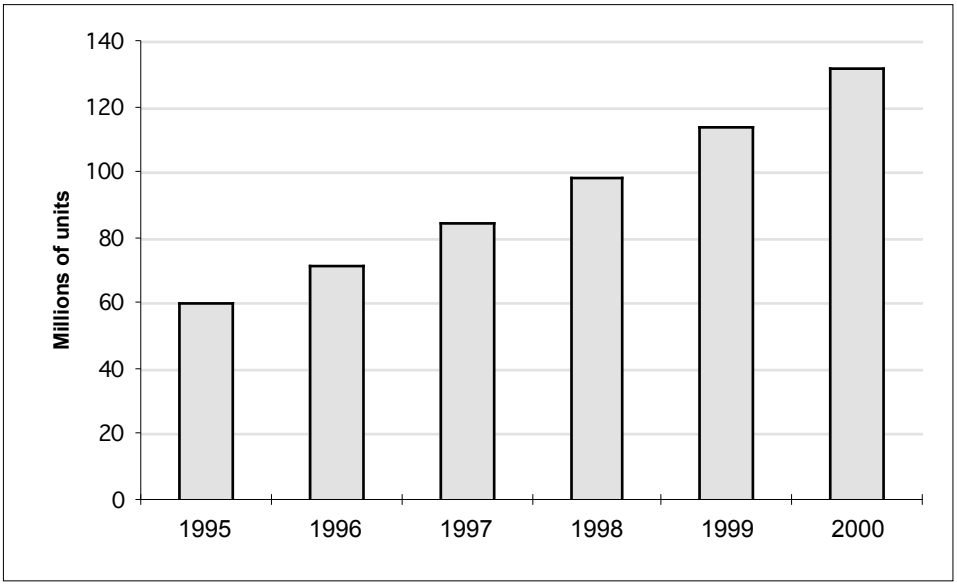


Exhibit 2.4 The predicted growth of the PC industry
Source: *DataQuest*, 29/4/96

The growth of the market for PCs resulted in widespread changes in the computer industry. At the same time, there were changes taking place in the consumer electronics and telecommunications industries. Driven by transforming technologies, these industries were converging to form a 'new' industry. Certain aspects of this convergence were evident at the time of the acquisitions, but for many firms these changes simply represented an increased level of uncertainty within their competitive environment. In the 1990s, particular driving forces relating to this convergence have become more evident. The following section outlines the key factors that have influenced the formation of this new and complex competitive environment.

Convergence towards the 'digital industry'

Firms in industry sectors ranging from computers to consumer electronics, electronic devices to telecommunications, and entertainment media to software publishing, increasingly find themselves operating within a common competitive environment. This shared environment has been labelled the 'digital industry' (Hamel & Prahalad, 1994). The hardware sector of this industry alone has been predicted to be worth over $1 trillion by the year 2000 (*DataQuest*, 9/5/95). It has boundaries which are ill-defined and fluid in their behaviour (See Exhibit 2.5).

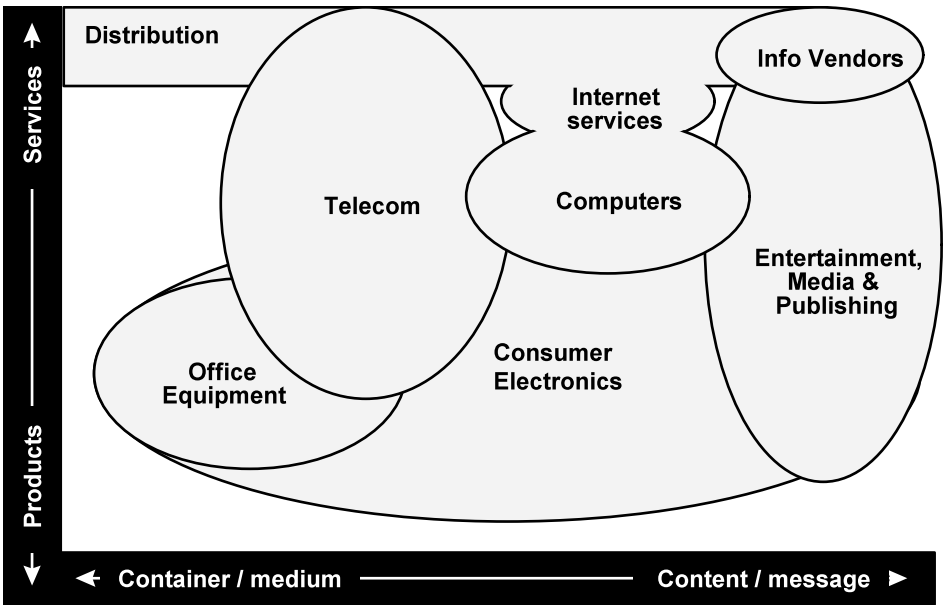


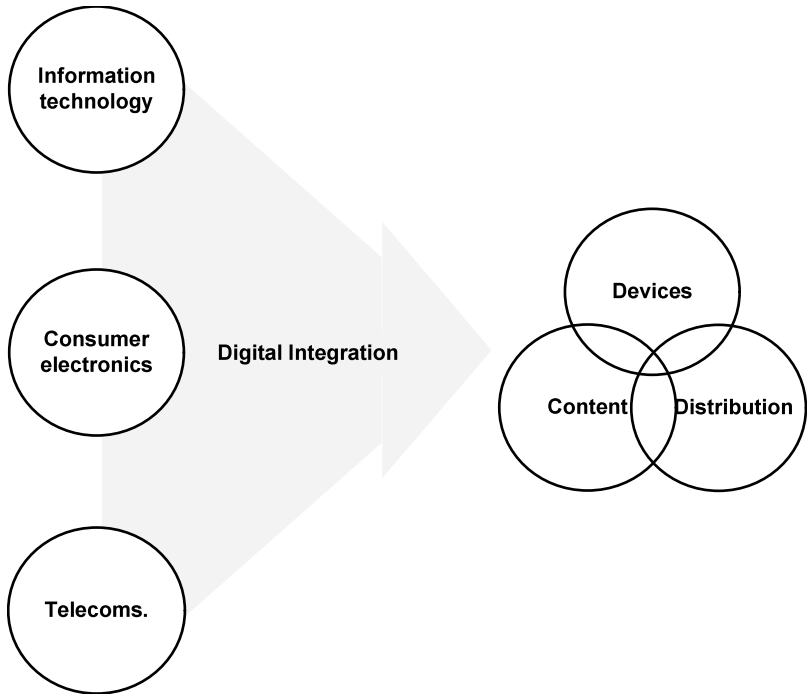
Exhibit 2.5 The merging fields of the digital industry
Source: Adapted from Apple Computer (1993)

The industry is usually viewed in terms of the converging sectors of computing, telecommunications and consumer electronics. However, it is more helpful for our purposes to view it in terms of the *devices*, *content* and *distribution* (See Exhibit 2.6).

Devices describes the hardware needed to input, process, store and output various forms of data. Devices encompass not only the various products which display, record and transmit data, but also the components that are joined together to form these devices, such as the integrated circuits, display screens and storage systems.

Content encompasses all the forms of data that are input, processed, stored and output by the devices. Content therefore includes application software, video games, TV programmes, news services, electronic commerce services and films.

Distribution includes all means by which the content is passed from one location to another. This includes conventional and cellular telephone networks, terrestrial, cable and satellite television broadcasting, the Internet and dedicated 'area networks'.



Content	Music, films, application software, video games, TV shows, news, electronic commerce.
Distribution	TV (terrestrial, cable, satellite), telecommunications (copper, fibre-optic, cellular), Internet.
Devices	Consumer electronics, computers, electronic components, communication devices.
Digital integration	The switch from analogue to digital core electronic technology.

Exhibit 2.6 The focus areas of the digital industry

As the barriers which previously separated the industries of telecommunications, IT and consumer electronics begin to dissolve, new opportunities to develop distinct products and services are emerging. Which of these product and service areas are likely to take-off, and which technologies will drive the development of new products and services is unclear. The speed and uncertainty of the direction of change within the digital industry requires firms to maintain a high level of responsiveness. Firms must develop and maintain an organisational structure that allows the firm to respond quickly and effectively to changes in technology and competitive conditions.

Among the forces which are influencing the formation of this industry are: a widespread move from analogue to digital core electronic technologies in a variety of product areas; changes in the telecommunication industry; the saturation of certain consumer electronic product areas; the widespread penetration of the personal computer; the growth of the video games industry; and the rapid uptake of the use of the Internet. Each of these areas

in described briefly in the following sections.

Analogue to digital technologies

It is possible to encode text, graphics, voice, music and video in a binary format - a series of 1s and 0s. Once this data has been 'digitised', it then becomes possible to store, manipulate, transmit and merge this data in many different ways (Cawson, 1994). The development of standard formats for the compression of digitised data[16] allows the movement of this data between media and locations using minimal capacity. Data can be stored and transported in a magnetically and optically readable format[17]. The data can be transmitted using conventional (copper wire or fibre-optic) and cellular telephone networks, as well as via dedicated data transfer networks (Local Area Networks (LAN), Wide Area Networks (WAN)).

The ability to treat diverse forms of data with a degree of commonality has proved to be one of the most powerful forces driving the convergence of diverse sectors to form the digital industry. Once data is codified in this way, it becomes possible to move across previously impenetrable boundaries between product areas. The possible application areas enabled by this switch from analogue to digital technologies are manifold. Firms in the digital industry seek to explore ways of making what is already technically possible, commercially feasible.

The key issues relating the move from analogue to digital core electronic technologies to the formation of the digital industry can be summarised as:-

- Digitisation has given text, sound, picture and video data a common format for storage, manipulation and transmission.
- Boundaries between product areas and industry sectors are becoming gradually transparent.

---

[16] Standard formats include JPEG for picture data, and MPEG for video data.

[17] These include magnetically coated disk (FD), magnetically coated tape (DAT), optically-readable, surface-coated disk (CD, CD-ROM, DVD), magneto-optical disk (MO), phase-change dual technology disk (PD) and various forms of integrated circuit memory (Flash, EPROM).

- Firms from previously discrete sectors now find it possible to compete and co-operate within a common competitive environment.

Changes in telecommunications

The deregulation of telecommunication services world-wide has increased the level of competition among service providers, who now include cellular and cable telephone companies. The value of the core business of carrying voice calls is reducing as competition drives both prices and margins down (*The Economist*, 11/9/93). Telephone networks must also be able to provide reliable, fast and capacious links for the transfer of computer data around the globe. While it is possible to use existing copper wires to do this[18], fibre optic networks and satellite links provide a more satisfactory solution for the increasing demand for high capacity data transfer over long distances. The cost of upgrading all telephone networks to high-bandwidth fibre-optic is very high, and demand for it comes at a time when price competition among telecommunications service providers is particularly fierce. Telecommunication firms need to find new ways to derive profit from the telephone networks through the provision of increasingly wide ranging services for the consumer. The fierce competition has led to telecommunications firms merging their operations with of those cable TV firms to provide a range of services encompassing telephony, television and Internet access[19].

The key issues relating the telecommunications sector to the formation of the digital industry can be summarised as:-

- Deregulation of telephone services world-wide has led to increased competition for telecommunication service providers.
- The spreading of fibre-optic communication technology has enhanced the ability of telephone networks to be used for the carrying of high volumes of data.

[18] Asymmetrical digital loop subscriber (ADSL) technology allows conventional copper telephone lines to transmit reasonably high volumes of data - 6 million bits per second.

[19] An example of this can be seen in the emergent strategy of Cable & Wireless.

- Telecommunications firms are being forced to investigate new product and service areas to improve their profitability.

Diffusion of the PC

The widespread and rapid penetration of the PC (as described earlier) has been a strong force in the formation of the digital industry. The market has grown rapidly, and is predicted to continue growing into the next century. The emergence of the home-user market is pushing the PC into areas previously dominated by the consumer electronics firms and video game producers (See Exhibit 2.7). In response to the increasing demand for machines whose main purpose is entertainment rather than commercial applications, some consumer electronic firms are attempting to produce their own PCs[20].

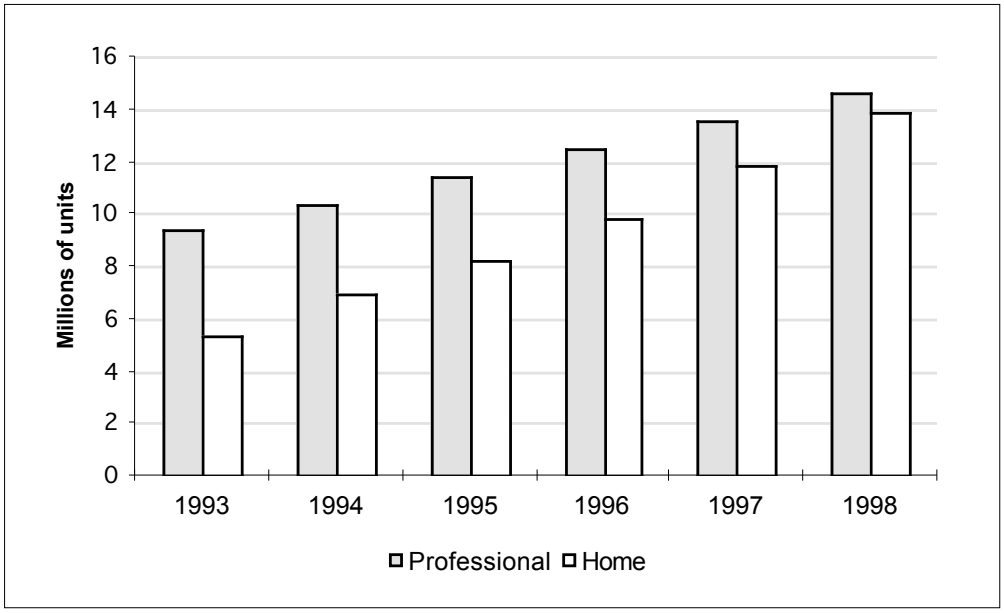


Exhibit 2.7 The predicted growth of the US home versus professional PC market
Source: *DataQuest*, 19/7/94

At the same time, PC producers are attempting to make the new generations of PCs more of a domestic appliance than a business tool in order to increase the level of market penetration. This strategy is illustrated by the emergence of the PC-TV - a PC which is capable of receiving and displaying TV broadcasts. In addition, new forms of data

[20] E.g., Japan's Sony announced in 1995 that it would produce a range of PCs aimed firmly at the home user (*Computer Weekly*, 16/11/95).

storage, such as the digital video disk (DVD) will also allow the distribution of films on disk which can then not only be replayed for display on TVs, but can also be used with PCs. As the bandwidth of telecommunication networks increase, it will become possible for users to download content in various forms directly to their PCs.

The key issues relating the PC sector to the formation of the digital industry can be summarised as:-

- High level of penetration of PCs into home and business markets have made the PC 'familiar' to a large and growing population of consumers.
- Increasing power and versatility of PCs now means that these machines can combine the previously separate functions of the devices such as the computer, TV, fax machine and video games console.
- Competition among producers of the hardware devices has become increasingly fierce as the devices themselves become increasingly generic.

Video games

The video games industry, for long ignored by the mainstream consumer electronics sector has grown fast. World-wide sales of games software amount to around £14 billion (Durlacher, 1994). The market is split between two categories of hardware platforms: dedicated games consoles[21] and PCs. Until 1995, the dominant platform was the console, but the increased performance of the newer PCs coupled with their widespread diffusion has allowed this sector to account for 66% of the games software sold (Durlacher, 1995). The overall market for games software has shown rapid growth through the late 1980s and early 1990s, but began showing signs of slowing down in the mid-1990s[22]. This slowdown has been due to consumers waiting for the emergence of new console

[21] Such as those made by the Japanese firms Sega and Nintendo.

[22] The market for console-based games has been dominated by two Japanese firms - Sega and Nintendo - who between them managed to capture 95% of all video games sold between 1990 and 1994 (Bowerdean, 1995). However, problems encountered by Nintendo in developing a new generation of machines, coupled with a strong market entry from Sony and the growth of the PC-based games market has caused Nintendo to lose its shared dominant position. The three key standards for games software are now Sega's Saturn, Sony's Playstation and the PC.

machines based on high performance technologies[23].

Emergent areas of business in this sector include the direct provision of software to users via cable networks (such as Sega with its Sega Channel) and via the Internet. The latter option is increasingly being used by software developers and has the advantage of rendering the process of producing copies of 'hard' software (i.e., cartridges and CDs) redundant. The distribution of software via the Internet and the consequent reduction in the need for removable data storage is discussed further on.

The key issues relating the video and computer games sector to the formation of the digital industry are:-

- Though initially regarded as a niche market, video games have diffused into mainstream consumer electronics and PC market sectors. (This may be regarded as an indicator of the future potential of other entertainment markets for products of the digital industry).
- Having largely missed the initial games boom, the large consumer electronics firms are keen to gain a share of this growing market.
- The selection of hardware platforms has become less important as the performance of PCs and consoles increases, and as cable and Internet distribution takes the place of cartridge and CD-ROM software publishing.

The Internet

The Internet has emerged from being a relatively obscure network of computers set up by the US Department of Defense in the 1960s and used for much of its early years to link computers at academic institutions, to one of the fastest growing sectors driving the formation of the digital industry. For the first 30 years of its existence the Internet was

[23] The market for machines based on 8-, and 16-bit technologies is saturated. Demand is expected to recover with the emergence of 32-, and 64-bit machines. The console market is also split between the 'cartridge' market and the CD-ROM based market. While cartridge offers very high performance, they are more expensive and time-consuming to develop and produce when compared with CD-ROM. Cartridges typically cost the software developers $33 and take 8 weeks to produce. CDs cost under $10 and take only one week to produce (*Investor's Business Daily*, 18/9/96).

used primarily for electronic mail - the transfer of text data from one computer to another. The development of graphics, video and audio transfer capability in the 1990s[24], coupled with the widespread diffusion of PC, has led to a sharp increase in the use of the Internet (See Exhibit 2.8).

The emergence of the use of Internet technology for communication within geographically dispersed organisations - 'intranets' - is one particular area that has shown unanticipated levels of growth (*Nikkei Business*, 18/3/96).

Software publishers are becoming increasingly keen to use the Internet for the direct distribution of software[25]. Direct distribution provides a means for publishing software without the need to produce large quantities of floppy, or compact disks. Upgrades can be directly sent to users' computers, and the on-line link provides software developers with a potentially more reliable form of market research than that provided by software registration cards[26].

---

[24] The World Wide Web ('WWW', or 'Web'), developed by CERN in Switzerland in 1991, provides a system of protocols to allow the transfer of linked 'pages' of data between computers. These pages may contain text, graphics, audio and video data.

[25] Interview with Godfrey, 25/4/96.

[26] Certain firms, including Oracle Systems and Sun Microsystems, believe that the Internet will be able to provide users with all the software they need - the PC will be replaced by a 'network computer' (NC) which will download all the elements of the software it requires, as and when they are needed. This will avoid the need for complex and largely unused software to reside within individual PC hard disk storage space. It will also remove the requirement for PCs to be complex devices, or 'thick clients' - comprising hard drives, large memories, and complex operating systems. The NC will be a 'thin client', consisting of only a processor, limited memory requirement and some form of communication circuitry in the form of a modem or Ethernet card (*Financial Times*, 2/10/96).

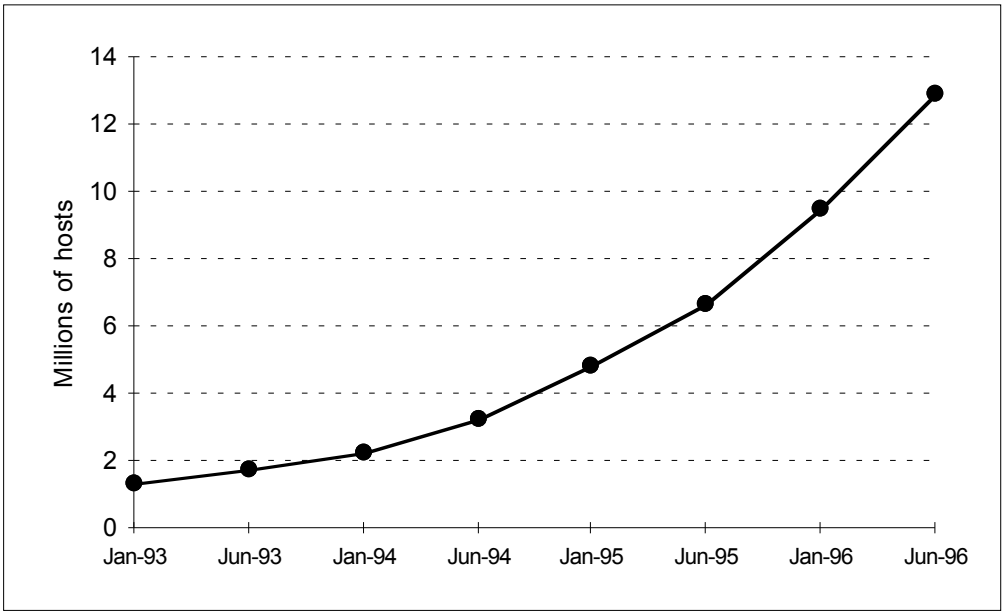


Exhibit 2.8 Growth of the Internet (as measured by number of computer hosts)
Source: *Network Wizards*, 1996.

The use of the Internet for software distribution illustrates a wider trend in computing. It can be thought of as representing the latest upheaval in a series of changes that have punctuated the development of the computer industry (as described earlier). The emergence of the mainframe, then the minicomputer and open systems based computing, marked the key technologies that have defined the evolution of the IT industry. The growth in use of the Internet has provided the latest contribution to an emerging paradigm shift[27] and this transformation has been largely *software* driven. The linking of computers which form the framework of the Internet has been in place for many years, but it was the development of the 'browser' software which provided the impetus for the widespread penetration of the Internet[28]. In addition, the Internet is changing the way software itself is written and distributed. By providing software applications via the Internet in small self contained units ('applets') when called for by the user, the nature of software itself is changing. Most importantly, these applets are hardware and operating system independent. Software applications become effectively tailor-made for individual users,

[27] This emergent paradigm shift can be regarded as a development within the fourth Kondratieff wave (Hall & Preston, 1988).

[28] Though the 'web' was developed in 1989, and its first implementation appeared publicly in 1990, it did not receive widespread popular use until the software browser NCSA Mosaic became available in 1993 (Gray, 1996).

regardless of which system they may be using.

The key issues relating the Internet to the formation of the digital industry are:-

- The Internet arguably represents a key contribution to the emerging paradigm shift in the computer industry.
- Access to the Internet will continue to widen with the diffusion of PCs with modems, NCs and WebTVs[29].
- The identification of those Internet services which will succeed and become commercially viable remains unclear.

Saturation of markets for consumer electronics

For consumer electronics (CE) firms, digitisation has provided a whole range of potential new product areas at a time when the demand for existing products based on analogue technologies, such as conventional TV and video cassette recorders (VCRs), is becoming saturated (*Financial Times*, 26/10/93). If we consider the four types of CE products identified by Cawson (1994), it is clear that the development of all types of product is being influenced by the spread of digitisation (See Exhibit 2.9).

Type	Stand-alone	Software-dependent	Broadcast-dependent	Network-dependent
	• Camcorder • Digital camcorder • Electronic calculator.	• PC • CD player, • DVD player, • Tape recorder, • VCR.	• TV • Radio • VCR.	• Fax • Cellular phone • NC.

Exhibit 2.9 A typology of consumer electronic products
Source: Adapted from Cawson (1994)

The quest for new growth areas has pushed the CE firms outside the boundaries of their 'traditional' areas of expertise[30]. The video games market was, to a large extent,

[29] A hybrid device which consist of a TV with the additional hardware and embedded software required to allow the device to capture and display data from the Internet.

[30] In their search for potential growth areas based on digital technology, there have been successes and failures. The development of the audio CD market, which was built-up upon the early agreement on standards between the two major protagonists (Sony and Phillips), and which had the backing of the music industry, provides a highly successful

overlooked by the large CE firms. These CE firms did not identify the growth potential of this market, and lacked the expertise to develop the high quality software (*Nikkei Weekly*, 17/4/95). However, as the video games industry grew a number of CE firms attempted to enter the market. The dominance in the market of the effective duopoly formed by Sega and Nintendo provided stiff competition for new entrants to the market in the mid-1990s. Japanese firms including Matsushita, NEC, Victor and Sony attempted to enter the market, but only Sony has been able to achieve any large scale success in recent years (*Nikkei Weekly*, 7/11/94).

Small, hand-held computers, or Personal Digital Assistants (PDAs), represent one product area for CE firms which is believed to hold great potential. These devices combine the function of a personal organiser with word-processing and communication capabilities. A problem to be overcome to allow the widespread diffusion of these devices is the present lack of agreement for standard operating systems (*Nikkei Weekly*, 3/10/96).

As stated earlier, the Internet has acted in many ways as a catalyst for the formation of the diverse sectors that make up the digital industry. One way in which its effects are being felt in the CE sector is through the widespread development of 'Web TVs'. These devices combine the function of a TV with the hardware and software required to access the Internet. CE firms including Phillips, Samsung, Sony and Mitsubishi Electric are all developing machines that will function in this way (*Multimedia Week*, 2/9/96)[31].

The key issues relating the consumer electronics sector to the formation of the digital industry are:-

---

example. The CD largely wiped out the vinyl LP record as the dominant form of music storage. However, the CD market itself is now reaching saturation point, and of the much heralded prospective replacement products, none have really caught on. Digital Audio Tape (DAT), Mini-Disk (MD) and Digital Compact Cassette (DCC) have all been pushed by various CE firms, but none have achieved market penetration to any great extent. The latest hope for a storage device which will provide the impetus for the development of a new range of consumer electronics products is the Digital Video Disk (DVD). Products based on this new storage media are now reaching consumers in selected markets (*Nikkei Weekly*, 4/9/96).

[31] CE firms are thus leveraging their skills to derive benefit from the Internet in two ways. One option is to develop PCs with enhanced multimedia capabilities (fast processors, large memory and storage capacity, dedicated audio and video cards). The other option is to enhance the functionality of TVs to include the ability to access the Internet.

- Saturation of certain product areas of the analogue electronics sectors has provided the impetus for CE firms to aggressively seek out new product areas based on digital electronic technologies.
- Digitisation has broken down the barriers between sectors, and allowed CE firms to leverage their skills into sectors previously dominated by computer firms.
- The Internet provides a whole new media for CE products to be built around.

Electronic devices

The continued growth within industry sectors that are combining to form the digital industry has fuelled demand for the various core components that form the core of the hardware devices. Of these, the semiconductors and display devices form two of the largest markets.

The dominant technology at present for display devices remains the cathode ray tube (CRT). Despite the fact that this technology dates back over 50 years, the CRT is still the main form of display device for the majority of TVs and computer monitors. Emerging as a replacement for CRT is the flat panel display. Flat displays come in two main forms: liquid crystal displays (LCDs) and plasma panel displays (PDPs). It is predicted that these flat panels will, at some point in the near future, replace the CRT for use as TV and computer display devices (See Exhibit 2.10).

Major uses for semiconductors in CE products, PCs and various telecommunication-related devices include memory chips, microprocessors, application specific integrated circuits (ASICs), and audio and video chips. The market for semiconductors derived from the anticipated emergence of the DVD related devices alone is forecast to be $3.6 billion by the year 2000 (*DataQuest*, 22/7/96). The maturing market for PCs and the advancing technologies of video games are still providing a large market for semiconductor manufacturers (*DataQuest*, 14/8/95).

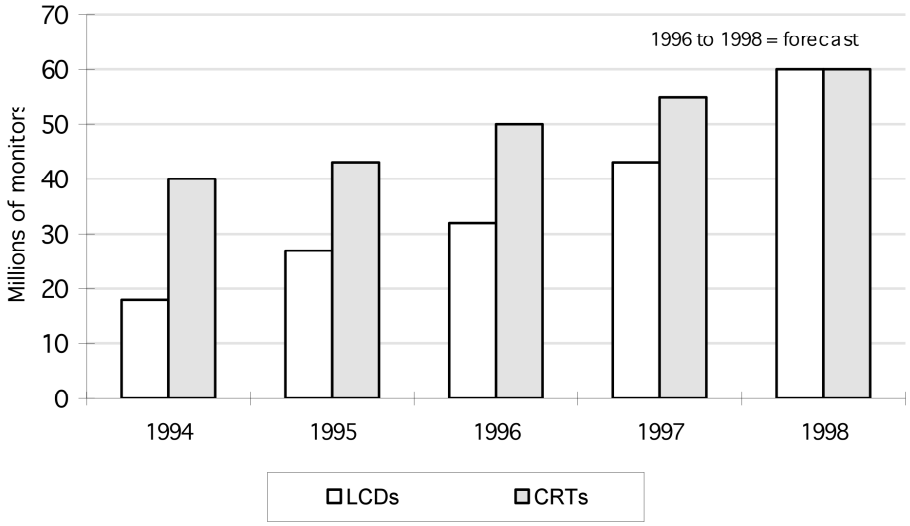


Exhibit 2.10 World-wide shipments of computer monitors
Source: *The Economist* (24/8/96) (Approximate data only)

Although demand for DRAM chips is cyclical (leading to dramatic peaks and troughs in demand[32]), the market for high capacity memory chips is predicted to continue to grow as increasingly 'memory-hungry' software for PCs continues to be developed. There has been a split between the producers of the memory chips (DRAM, EPROM, SRAM, Flash), and those who produce the processor chips (microprocessors and microcontrollers). Higher added value chips such as microprocessors and microcontrollers provide the producers with a product which is less likely to suffer from the dramatic price swings of the basic memory chips.

The key issues relating the electronic devices sector to the formation of the digital industry are:-

- Firms producing bulk, commodity, memory chips, such as DRAM, are highly susceptible to the market's dramatic demand swings.
- Semiconductor firms are seeking out new technologies and attempting to identify

[32] 4M DRAM chip prices in June 1996 were down 60% on the previous year due to excess capacity (*Investor's Business Daily* 12/6/96). Problems stem from a shift in demand towards the higher capacity chips. Demand for 4M chips is falling, as the demand for 16M and 64M chips increases (*Nikkei Weekly*, 8/10/96). Such shifts in demand from consumers (i.e., the product assemblers) can cause delayed knock-on effects for the chip manufacturers. Coupled with this is the leap-frogging of generations of chips. Samsung recently announced a functional 1 gigabit DRAM, which is effectively three generations ahead of 16 megabit chips (*Nikkei Weekly*, 5/11/96).

which products, or product areas these can be built into.

- The increasing demand for flat panel displays provides an opportunity for those firms, predominately Japanese, who have invested heavily in this area.

Storage media

In the past, the separate industry sectors of consumer electronics and computing had their own standards for the storage of data, e.g., video data was stored in analogue form on magnetic tape, and computer data was stored in digital format on magnetically coated disks or tape. With the diffusion of digitisation throughout industry sectors, it has become possible for storage standards to cross platform boundaries. One of the first and most successful examples of this has been the CD, which has moved from being a device used for the storage of digitised music, to a high capacity storage device for PCs. The DVD is predicted to be another device conforming to a standard which encompasses both the needs of the consumer electronics sector as well as the computer sector.

A wider trend observed as convergence continues is for the data to be stored away from the user. For example, the Internet potentially provides a vast 'virtual' storage space for data, remote from the individual user, and advances in distribution technology mean that it is possible to have 'video-on-demand' at locations remote from the source. Firms who have focused exclusively in the past on the provision of data storage media for the individual users are now having to find alternative ways of deriving value from their skills. In addition, the use of storage media for the distribution of software is declining as the Internet becomes a viable means of direct distribution[33].

The key issues relating the data storage media sector to the formation of the digital industry are:-

- There has been an emergence of cross-platform standards for removable data storage.

[33] In November 1996, 'Egghead Inc.' became the first major software retailer to deliver its programmes directly to the customer via the Internet. Analysts predict that within twelve months, the Internet will account for 20% of software sales (*Wall Street Journal*, 8/11/96).

- There is a wide array of choices for the computer users, as the fight for the definition of new standards intensifies.
- The wider trend of shifting the data storage requirements away from the individual users.

From hardware to software

Hardware and software, or devices and content have been mutually reinforcing elements within the demand system for computers and certain types of CE products. Demand for new devices is dependent upon there being content available to use with them. Yet content will not be developed unless there is widespread diffusion of the required devices. For example, PCs only began to achieve respectable levels of diffusion once various key software applications became available. Once this had occurred, then demand for the software fuelled demand for the hardware and visa versa (Cringely, 1992). The computing, consumer electronics and telecommunications industries are predicting a general shift of the profitable areas of their businesses from being located within the devices side, to the content and distribution side[34]:-

> It is the owners of the networks who will be the main beneficiaries of the multimedia age, followed by those who provide the services (Nobuyuki Idei, Managing Director of Sony, as quoted in *Financial Times*, 2/11/94).

The key issues relating the changing relationship between the hardware and software industries to the formation of the digital industry are:-

- There is a general trend towards the hardware products becoming more generic in nature.
- There is a high degree of uncertainty as to which of the 'service sectors' within the digital industry will actually take-off and provide the most lucrative areas for firms to operate within.
- Hardware firms may face problems when attempting to acquire the relevant skills in

[34] Interview with Shimpo, 1993; Goto, 1996; Davison, 1996; Godfrey, 1996. See Appendix II for details of interviews.

the provision and distribution of content.

Alliances within the digital industry

Four interrelated features of the digital industry can be identified from the information given in the previous sections - *uncertain, dynamic, open* and *international*.

1. Firms operating within this industry are faced with a competitive environment which is highly uncertain. It is extremely difficult in a competitive environment such as this to predict future trends accurately, and develop a strategy which allows firms to maintain competitive advantage in the medium- to long-term. One of the clearest illustrations of this unpredictability is the unexpectedly fast growth of the Internet and 'spin-off' developments such as 'intranets', and the resultant new patterns of software development and distribution. Products developed within the digital industry will tend to be systemic in nature, i.e., their diffusion is dependent upon various complementary innovations (Chesbrough & Teece, 1996). An example of this was discussed earlier in relation to PCs, which only began achieving market penetration once 'killer applications' had been developed. Not only is the success of a given product dependent upon complementary innovations, but there is also the need to consider standards. As was stated earlier:-

   > [..] competitive success flows to the company that manages to establish proprietary architectural control over a broad, fast-moving competitive space (Morris & Ferguson, 1993:87).

Proprietary architectural control is not the same as maintaining a closed system, rather it refers to the need to provide a dominant design, to which others will conform in order to present the consumer with a connectable product range. Attempting to identify which technologies will emerge to become the *de facto* standards is a challenge facing all firms in this competitive environment.

2. A second characteristic of the digital industry is the speed at which these changes in direction are occurring. The time between new technologies (or new combinations of existing technologies) being developed, these technologies reaching the market in the

form of new products or services, and these products or services becoming first technologically and then commercially obsolete is shortening (von Braun, 1990). This trend is noticeable in many industry sectors but is particularly prevalent in the competitive environment created by convergence towards the digital industry.

3. Linked with this fast pace of change is the third feature of the digital industry; the need for firms to have an organisational structure which is open, flexible and able to respond to changes by rapidly developing new products or services. In high technology industries, there is often a time-lag before products based upon new technologies reach the consumer. It may take time for agreements on standards for products and services based upon the new technologies to be defined. However, once these standards have been agreed, there is a need to introduce the new product or service to the market as quickly as possible. To do this effectively may well require close collaboration with other firms (Hamel & Prahalad, 1994).

4. The 'new industrial competition' described by Clark & Fujimoto (1991) stressed the way in which firms increasingly have little choice in deciding whether to compete internationally. In the digital industry this is predicted to be particularly true. As the technologies of the devices become more generic in nature they require a global presence to derive sufficient volume for economies of scale. Software and other forms of content require customisation to local needs.

These four features conspire to create a competitive environment within which it is particularly difficult for firms to formulate effective strategies. This environment presents a paradox for firms: in some ways it favours the small, nimble firm which is able to respond rapidly to signals from the market, or to apply emerging technologies into niche opportunity areas (Mills, 1996). In other ways, it would seem to favour the large firm, which is able to maintain a wide portfolio of skills which it can lever into opportunity areas as and when they emerge. However, the diversity of skills and assets required to compete effectively in this convergent environment are so wide that no one firm can hold all these skills and assets internally while maintaining a structure that provides the

required level of responsiveness to changing conditions.

This paradox facing a firm attempting to compete in this complex competitive environment (which requires firms to maintain the responsiveness of a small firm with the wide-reaching skills and assets of a large firm) is one that can be addressed though the use of alliances:-

> Today, few companies can afford to develop internally all the technologies that might provide an advantage in the future. In every company we studied, we found a mix of approaches: Some technologies were "purchased" from other companies; others were acquired through licences, partnerships and alliances; and still other critical technologies were developed internally (Chesbrough & Teece, 1996:70-71).

Alliances[35] provide a means for firms operating within conditions of uncertainty and change to tackle complex business opportunities that would otherwise be impossible, or at least impractical for them to manage alone[36]. In some cases, the development of a complete product segment has been dependent from very early in the development process upon having a number firms knitted into alliances, e.g., the development of High Definition Television (HDTV) (Cawson, 1994). The high level of use of alliances as the process of convergence accelerates can be regarded as a feature of the digital industry (Hamel & Prahalad, 1994).

Within each of the areas of devices, networks and content, links are being made. For example, alliances are being formed between firms whose core businesses can be regarded as devices, such as microprocessor chip manufacturers forming links with PC manufacturers. Links have also be formed between firms within differing focus areas, such as the links between Sony (devices) and CBS Records (content), as well as the BBC (content and distribution networks) and ICL (devices and distribution services).

Alliances within this industry allow firms to derive benefit in a number of ways, as are

---

[35] Here used to encompass a range of strategic tie-ups including loose 'agreements', through formalised joint ventures through to outright acquisition of ownership of an external firm.

[36] The extent to which firms operating within this industry believe that alliances in the form of M&A are important was revealed in a recent survey by one M&A advisory service. This revealed that an astonishing 72% of companies operating in the IT industry were planning to use M&A within the following 12 months (*Investor's Business Daily*, 19/12/96, as reported in *Educom* newsgroup).

illustrated in the following sections.

Spreading of risk and cost.

The uncertainty of the competitive climate in which firms are operating and the cost of investing in emerging technologies has acted as an impetus for the forming of alliances among firms who were competing in the same markets. For example, the cost of developing the new generation of DRAM chips, as well as the high costs of producing existing chips in a market susceptible to dramatic swings in demand has led to the formation of a swathe of alliances between chip producers. These include a tie-up between IBM (US), Siemens (Germany) and Toshiba (Japan) to develop the 'next generation' 256M DRAM chips (*Financial Times*, 20/6/95), and the tie-ups between NEC (Japan) and Samsung (South Korea) to share facilities in the production of 4M and 16M DRAM chips as well as the development the 256M DRAM chips (*Financial Times*, 14/2/95).

Hedging bets.

Such is the level of uncertainty within the competitive environment leading to the formation of the digital industry that firms may be forced to gain, or have access to skills in a wide range of emerging technologies. The identification of which of these emerging technologies will be important is highly problematic. Firms therefore may choose to invest in, or form links with, a wide range of firms specialising in emerging technologies to avoid missing an opportunity area. An example of this form of motive for forming alliances can be seen in the case of General Magic. General Magic was founded in 1990 as a spin-off from Apple Computer in the US to develop a software platform for PDAs as well as an 'agent-based' programming language for use over telecommunication networks. As both these areas have yet to achieve widespread penetration[37], many firms

[37] General Magic's 'agent-based' programming language, Telescript, was originally designed for use over telecommunication networks, and consequently received widespread interest from telecommunication firms (as is shown in Exhibit 2.11). However, the rapid growth of the Internet has shifted the focus of attention for these firms. Sun Microsystems have developed a programming language, called Java, which provides a similar functionality for Internet users and which is, unlike Telescript, achieving high levels of penetration (*The Economist*, 3/2/96).

have been keen to make certain that they have access to these technologies for when (and if) the market takes-off (See Exhibit 2.11).

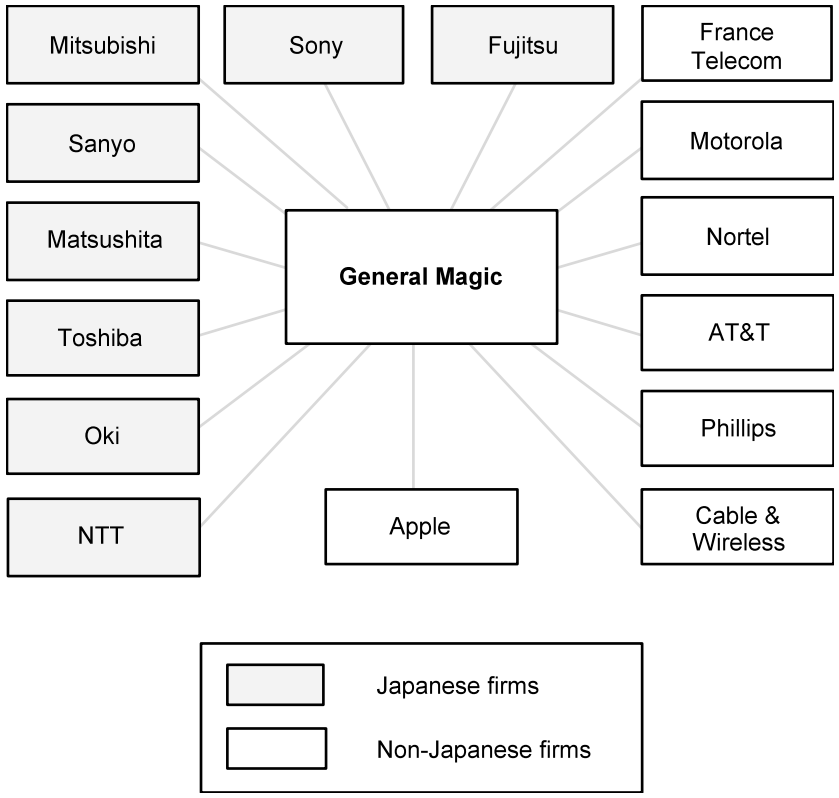


Exhibit 2.11 General Magic alliance partners
Source: General Magic (1996).

Achievement of 'critical mass'

In certain areas of this competitive environment it is necessary for firms to achieve a given size if they are to be able to compete effectively. Using the example of PC manufacturing, it has been recognised that as the products themselves become ever-more generic, with prices and margins being driven downwards, it is necessary for firms operating in this sector to achieve a size which allows them to benefit from certain economies of scale, such as cost benefits in component procurement. Also, the requirement for a global presence and the need to provide a full product range may drive firms together. An example of this can be seen in the alliance (and subsequent merger) between NEC in Japan and Packard Bell in the US to form a global PC manufacturing operation (*DataQuest*, 13/6/96).

Internalising new skills

Aside from having access to emerging technologies through alliance partners, a firm may also use alliances as a way of internalising some particular skill. By working with a partner who has skills and knowledge in a particular area, a firm may be able to internalise those skills and knowledge. As the speed of change grows ever faster, it becomes increasingly necessary for firms to be able to internalise skills rapidly from external sources:-

> Product development cycles now commonly exceed product life cycles, making it necessary to acquire new technologies to avoid missing a window of opportunity (Representative of Broadview Associates, M&A analysts, as quoted in *Financial Times*, 1/2/96).

An example of this can be seen in Apple Computer's development of a notebook sized computer. Apple realised the potential market that a product built around the 'Macintosh' design might have, but was unable to develop such a product itself. A link was made with Sony, a firm renowned for its skills in miniaturisation, who developed Apple's first generation of notebook-sized computer. Subsequent generations of Apple's notebook computer were able to draw upon skills and knowledge internalised through working with Sony.

Positive reinforcement, or 'synergistic benefits'

There have been a number of alliances formed between those firms which have concentrated on the production of devices, and those firms whose core business lies in the provision of content in some form or another (*Nikkei Weekly*, 31/10/94, *Financial Times*, 26/10/93). In the early 1990s, a number of such alliances were formed between Japanese consumer electronics producers and various Hollywood film studios. These were motivated by a desire to either achieve some form of synergistic benefit from having content providers and device producers in close contact, or by the desire to have a positive feedback cycle in operation. Such a feedback cycle was believed to provide those firms involved in the forming of the alliance with benefits in pushing a given new standard of devices, For example, the level of demand for new consumer electronics devices is often low until consumers can be convinced that there will be sufficient content

available for them to warrant purchasing such a device. By having content providers and device producers in close connection, it was believed that technology trajectories could be more easily predicted and strategy more easily formulated. One example of this can be seen in Sony's acquisition of CBS Records, and the subsequent development of the MiniDisk, a candidate for the replacement of the CD.

Thus, it can be seen that the features of the competitive environment leading to the formation of the digital industry indicate clearly the requirement for successful firms to be competent at, among other business skills, the managing of alliances.

Japanese firms within the digital industry

In this section, a brief overview is given of the strengths and weaknesses of Japanese high technology firms with respect to their ability to compete in the digital industry. The use of alliance within each of these sections is highlighted where appropriate. The aim here is not to detail exhaustively the strengths and weaknesses of the Japanese firms attempting to operate in this sector. Rather, it is to point towards certain weaknesses that are being rectified through the use of alliances.

Devices

One of Japan's most successful post-war achievements has been the growth of its consumer electronics (CE) firms. CE firms have achieved high levels of penetration in the markets for a wide range of audio and video (AV) products (Ohsono, 1995)[38]. CE firms have been able to develop or internalise a range of skills and technologies in the production of a wide variety of CE goods. The strength of the Japanese CE firms has been their ability to produce well designed, quality products at a reasonable price for the demanding Japanese consumers.

Japan's CE firms are leading in the development of DVD products for home use (*Nikkei Weekly*, 4/9/96). CE firms hope that the DVD sector, in the form of video and audio

[38] AV covers a spectrum of products which includes TVs, VCRs, video cameras, radios, and record, tape and CD players.

players for home use, as well as DVD-ROMs for computers will revitalise the CE market.

While many CE sectors have been dominated by the large firms such as Matsushita, Sanyo, Sharp and Sony, international success has also been captured by relatively small firms such as Sega and Nintendo in the market for video games (as discussed earlier, and in *Durlacher*, 1994;1995).

The Japanese IT industry has, with government assistance, been highly successful in domestic and, to a certain extent, international markets[39]. Fujitsu - "Japan's IBM" is ranked as the world's second largest computer manufacturer (*Nikkei Weekly*, 13/9/93).

Combining the strengths of the CE firms with those of the IT industry is resulting in a situation where Japanese firms should be able to produce the appropriate products for the digital industry. Japanese firms are seeking alliances not only domestically, but also internationally to harness the combined strengths of CE and IT firms. Two illustrations of this can be seen in the alliances between Fujitsu (IT) and Sharp (CE), and Toshiba (CE & IT) and Apple (IT) (*Nikkei Weekly* 31/1/94 & 21/11/94). Some commentators are observing that it may be the CE sector which advances the speed of convergence towards the digital industry:-

> Traditional PC makers have probably pushed the consumer market as far as they can. It will take outsiders with consumer electronics experience like Toshiba and Sony to break into the larger consumer market (Andy Grove, CEO of US chip-maker Intel, as quoted in *Fortune*, 28/10/96).

In the field of office automation, Japanese firms have achieved remarkable successes. Aside from word processors and office desktop PCs for the domestic market, firms in this sector have achieved international success in laptop computers, laser printers, bubble-jet printers, photocopiers and calculators (Ohsono, 1995). Exhibit 2.12 gives a schematic view of the strengths held by Japanese firms, and how they may to be combined with the skills held by non-Japanese firms to form the typical integrated products of the digital industry.

---

[39] See Anchordoguy, 1989; Fransman 1990; 1995 for details of the development of the Japanese IT industry.

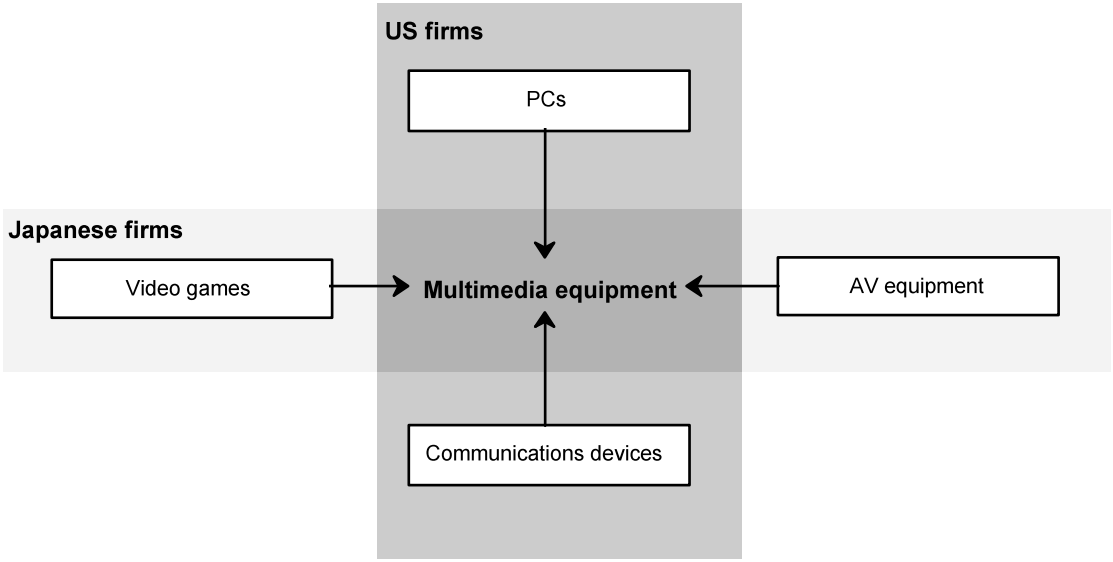


Exhibit 2.12 Competences required in the development of 'multimedia' hardware
Source: Japan Development Bank (1995)

One of the Japanese firms' core strengths has been in the manufacture of the components that combine to form the devices of the digital industry. Details of two of these are highlighted in the following sections.

The first of these is the strengths held by Japanese firms in semiconductor technology. Japanese firms have gained a large share of the market for semiconductors. Semiconductors can be viewed as an essential 'raw material' for the devices that make up the hardware side of the digital industry. As can be seen from Exhibit 2.13, five out of the top ten producers of semiconductor devices are Japanese.

Firm	Country	1990	1991	1992	1993	1994	1995
Intel	US	5	4	1	1	1	1
NEC	Japan	1	1	2	2	2	2
Toshiba	Japan	2	2	3	4	3	3
Hitachi	Japan	3	3	5	5	5	4
Motorola	US	4	5	4	3	4	5
Samsung	South Korea	-	-	-	7	7	6
TI	US	7	7	6	6	6	7
Fujitsu	Japan	6	6	7	8	8	8
Mitsubishi	Japan	8	8	8	9	9	9

Electric							
Philips	Netherlands	9	10	-	-	-	10

Numbers refer to ranking within top ten by sales

Exhibit 2.13 World semiconductor rankings
Source: Asahi (1994-5)

If the figures for semiconductor devices as used in consumer electronics are separated from those used in industrial electronics, the dominance of the Japanese firms can be seen to be even greater (See Exhibit 2.14).

Company	Country	1995 Revenue	1995 Market Share (%)
Toshiba	Japan	3,286	13.4
NEC	Japan	2,710	11.0
Matsushita	Japan	1,905	7.7
Phillips	Netherlands	1,724	7.0
Sanyo	Japan	1,613	6.6
Others	-	13,375	54.3
Total		**24,613**	**100.0**

Exhibit 2.14 Semiconductor vendors for consumer electronics
Source: *DataQuest*, 20/8/96.

The Japanese semiconductor firms have tended to focus efforts on the production of DRAM chips, and to seek out ways of increasing the capacity of these chips (See Exhibit 2.15). There has been a negative and positive side to Japan's dominance of the market for memory chips. On the positive side, having skills and large capacity in the manufacture of the 'raw material' required for almost all products in the digital industry has put the Japanese in a very strong position. On the negative side, excessive reliance on a product for which demand is highly volatile has led to restructuring by the major chip manufacturers (*Nikkei Weekly,* 18/9/96).

Country	Processor semiconductors (% share of world-wide production)	Memory semiconductors (% share of world-wide production)
US	67	15
Japan	28	62

Exhibit 2.15 US-Japan division of semiconductor memory and devices
Source: Japan Development Bank (1995)

The second component group in which Japanese firms have developed competence and market share is that of display devices. Emerging as a replacement for CRT, based on technology some 50 years old but which still provides the display devices for the majority of TVs and computer monitors, is the flat panel display. Japanese firms dominate both LCD and PDP markets (*Nikkei Weekly*, 31/10/96), and it is predicted that these panels will, as described earlier, replace the CRT for use as a TV and computer display devices.

Content

Japanese firms have strengths in niche areas of content for the products of the digital industry, such as video games software. In other areas of content, such as application software[40] and film production, the Japanese have been less successful. One of the key forces driving convergence, the growth of the Internet, illustrates the problems facing Japanese firms.

Japan, compared to many Western countries, has been slow to adopt the Internet owing to a number of factors. These include the fact that the Internet is largely based on the English language, fewer than 10% of Japanese computers are linked to a network of any kind, and fewer than 10% of Japanese offices are computerised (*Financial Times*, 22/1/96, with reference to 1995 data)[41]. Japan's slowness to embrace the Internet points to a wider problem for Japanese firms. As the growth has been so rapid, and driven by small, nimble firms able to spot opportunities and derive profit from them, there has been little time for long-, or even medium-term planning. The Japanese government has set up study groups to analyse the potential impact of the Internet on Japanese business

[40] Lack of strengths in certain type of software causes problems when it comes to developing products based upon open standards. This can be seen in the struggle for the development of an operating system for small, handheld computers, or personal digital assistants (PDAs). Japanese firms, in order to ensure that their contribution to this sector of the digital industry is internationally compatible have sought to join US based consortia for the development of the basic operating system for these machines. This can be seen in the alliances that surround 'Windows CE' and 'Magic Cap' (*Nikkei Weekly*, 3/10/96).

[41] However, others argue that Japan is adapting fast to changing conditions:- "Japan is second only to the United States in the number of companies investing in developing highway building blocks and the highway's content" (Gates, 1995:237).

(*Financial Times*, 22/1/96). However, the dynamic nature of the Internet related business opportunities are such that by the time these groups report back, the situation will have advanced to a new level. Such a fast moving environment is ill-suited to slow, meticulous planning.

Aware of the increasing importance of the provision of content, some Japanese firms have sought to gain access to the 'soft' resources of film and music through the use of acquisitions (Ohsono, 1995). The foray by Japanese firms including Sony, Matsushita and Pioneer into the US film-making industry has highlighted the problems faced by Japanese firms seeking to gain access to the content sector of the digital industry. All three of these firms invested heavily in US film studios, but have faced mounting financial losses resulting from inexperience in dealing with an "alien business culture" (*Nikkei Weekly*, 31/10/94). However, it has not been completely unsuccessful; Sony's purchase of CBS records allowed the Japanese firm to ensure that there would be a reasonable amount of content available for its Mini Disk (MD).

Networks

The deregulation of the Japanese telephone industries in 1986 has resulted in a similar situation facing Japanese telephone companies as is facing their global competitors. As was discussed earlier, telecommunication firms are facing intense and increasing competition. There is a need to find ways of deriving profit from the telephone networks other than from the carrying of voice data. Also, the up-grading of existing copper lines to fibre-optic to give high bandwidth links to Japanese homes and offices has faced problems in funding (*The Engineer*, 23/9/93)[42].

Japan's giant telephone company, NTT, has been seeking ways to smooth its passage into the digital industry by seeking out alliance partners overseas, in order to broaden its range of competences and potential product and service areas. Examples of such alliances

[42] The problems rest in deciding the spilt between public and private sector funding. Gates (1995) contends that:- "Any Government getting involved will need to track new developments and be prepared to shift directions. Such flexibility required technological expertise that, with the attendant risks, is better covered by industry" (Gates, 1995:239).

include NTT's links with General Magic (See earlier Exhibit 2.11) and other US firms who have "superior software skills" to NTT (*Nikkei Weekly*, 31/1/94). Such skills are hoped to provide the Japanese firms with a positive feedback loop to increase demand for their products and services. An example of this is Sony's publicised wish to see NTT begin a communications service based on General Magic's software, thus driving demand for more products to use with this communication network (*Nikkei Weekly*, 31/1/94).

General comments

Certain points relating to the strategies of Japanese companies attempting to compete in the fast moving and uncertain environment leading to the formation of the digital industry can be drawn from the points raised in the previous sections. It has been argued that certain features of Japanese firms that have given them competitive advantage in the past may result in these same firms being ill-suited to operating in a dynamic and uncertain environment. Using the case of the PC industry, Cringely (1992) illustrates this point:-

> The Japanese have grown rich in other industries by moving into established markets with products that are a little better and a little cheaper, but in the PC business the continual question that needs asking is, "Better than what?" Last years model? This years? Next years? By the time [they] think they have a sense of what to aim for, the state of the art has usually changed (Cringely, 1992:16).

This view of what is required to be successful in the digital industry is supported by the CEO of the US firm Silicon Graphics:-

> Long term product planning in our business is dangerous [..] because it forces companies to make wild guesses about what customers might want. [..] Long term planning weds companies to approaches and technologies too early, which is deadly in our marketplace and others. No one can plan in the future. Three years is long term. Even two years may be. Five years is laughable (Ed McCracken, as quoted in Prokesch, 1993:137).

This contrasts starkly with the methodical planning and slow consensus building that has been identified as a core strength of Japanese manufacturing firms. It becomes clear that Japanese firms, basing their strategies on "adaptive persistence" (Pascale, 1984) may find the increasingly fast moving and uncertain environment of the digital industry hard to compete in using skills developed for more clearly segmented and maturing industries:-

> [..] in the fast moving world, by the time you've [reached consensus] its too late, because the world has changed. [..] If you're building a mainframe computer with a 5 or 7 year cycle, then that isn't a

> problem. If you're dealing with a world of [the digital industry] where things change very quickly then this isn't a clever characteristic to have (Interview with Davison, 28/2/96).

It begins to become clearer that following analysis of the nature of the digital industry that certain Japanese firms *may* find themselves ill-suited to competing within this fast moving environment. The use of alliances by Japanese firms is one way in which they are seeking to learn new skills to allow them to compete in this new industry.

Conclusions

The aim of this chapter has been to provide a brief description of the change in the competitive environment of the IT industry at the time of the acquisitions and in the years following. A fair description of this complex environment warrants much greater analysis than it is possible to provide within the constraints of space of this dissertation. This chapter has thus only aimed to provide a view of certain key factors pertinent to addressing the research questions.

Chapter 3 Literature review

Chapter overview

The focus of this Chapter is an exploration of the literature which examines the strategic options open to firms attempting to maintain growth in the face of a fast changing environment.

Following the examination of the various generic strategic options open to a firm, attention is brought to rest on two specific areas of strategic management. Firstly, as the changes in the environment were driven by emerging technologies, this review examines the role of innovation management. Secondly, as the core of this research is a consideration of the strategic use of corporate acquisitions, the review also highlights the complex management issues presented by the strategic use of acquisitions.

In summary, the literature reveals that corporate acquisitions represent what would seem to be an effective way to enhance the ability of a firm to innovate by providing a means to access new technologies and knowledge. Acquisitions also represent an effective way for a firm to reposition itself with respect to its environment in conditions of rapid change through diversification and internationalisation. However, the extreme difficulty faced in integrating the acquisitions may negate this effectiveness. For Japanese firms in particular, cultural factors result in the strategic use of international corporate acquisitions being fraught with difficulty. The literature provides us with insights into strategic management in a changing environment driven by fast emerging technologies. However, it also points to a certain incongruity. Acquisitions present such a series of complex managerial challenge for Japanese firms that it is hard to see why they would be viewed as a viable strategic response to environmental change. This review points to the need for some form of alternative perspective for viewing the behaviour of the Japanese firms which will assist in highlighting understanding of the benefits that have accrued through the acquisition of ownership of the UK firms.

Part I: Strategic Management

In this first part of the review, following a brief introduction to the main contexts of strategic management literature, we examine the link between the industrial and competitive *environment*, and the firm's *behaviour*. We examine the literature which focuses on consideration of the how a firm can maintain growth in the face of major environmental change. These issues are then tied-in with examination of the specific factors that characterise Japanese approaches to strategic management, which are themselves embedded in an understanding of the Japanese industrial and corporate system.

The nature of strategy

Strategy is defined by Chandler (1962) as being:-

> the determination of the basic, long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for those goals[43] (*Ibid*., 13).

The body of literature which explores the manifold dimensions of strategy and strategic decision making is vast. Even at the most basic level, definitions of what is encompassed by strategy and strategic decision making abound [44]. Such is the profusion of approaches to the topic that a number of authors have sought to provide frameworks for positioning the diverse approaches to strategy in relation to one another. For the purposes of this research, the definition of strategy and the issues encompassed by strategic decision making is taken from Johnson & Scholes (1993). These authors define the nature of strategy resting within issues connected with decisions made in certain *contexts* (See Exhibit 3.1). These contexts include relationship between the scope of the activities of the firm and matching of these activities to its environment.

---

[43] He continues in the militaristic vein to differentiate *tactics* from *strategy* by defining the former as "ensuring the efficient and steady use of current resources whose allocation has already been decided" (*Ibid*., 383).

[44] For example, for Mintzberg, strategy is simply about "[..] the positioning of an organisation in market niches" (1989: 25), whereas Pascale (1984) attributes a deeper significance to strategy by describing it as ".. much more than a conventional noun. It embodies an implicit model of how organisations should be guided and consequently pre-configures our way of thinking". For Itami & Numagami (1992) this strategy links in with the active nature of the organisation and its interaction with the environment as being "the dynamic design of the activities for the entire firm".

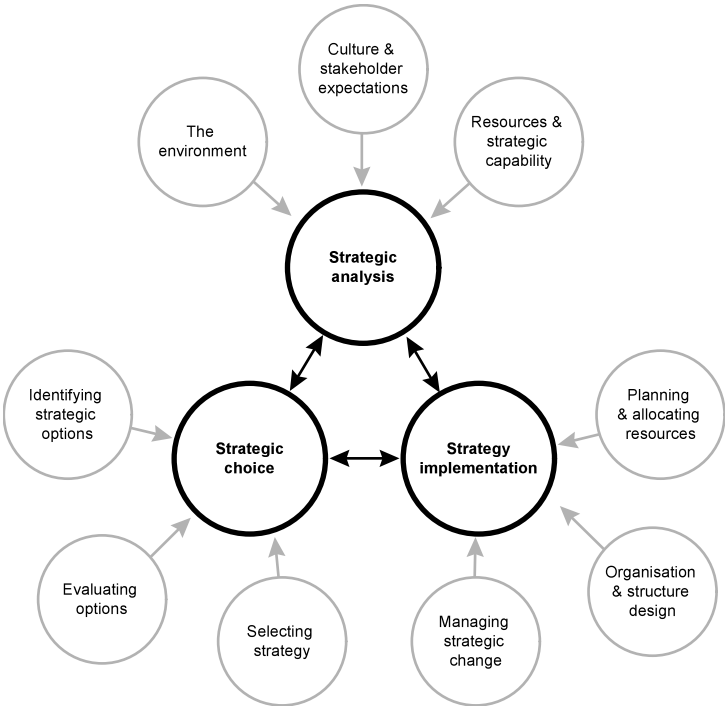


Exhibit 3.1 Strategic contexts
Source: Johnson & Scholes (1993)

Once the context in which strategic issues are dealt with has been identified, it is then useful for this research to identify the major groupings of strategic management theories. Whittington (1993) identified four broad categories of the theories of strategy- the Classical, Evolutionary, Processual and Systemic. (See Exhibit 3.2)[45].

Classical

In the Classical approach to strategy, rational planning provides the means to achieve what is perceived to be the main goal of all business - profit maximisation. The main writings in this field[46] draw certain key elements from academic economics, through the works of Porter (1980) and Williamson (1985), and military practice stemming back to Ancient Greece[47]. The Classical view of strategy can thus be summed up as being focused on the role of managers who will adopt profit-maximising strategies based on rational long term planning.

---

[45] These differing perspectives have evolved over time as dissatisfaction has emerged with the ability of contemporary strategy to provide reliable competitive advantage (Rothwell, 1992). Various alternative categorisations can be observed in the literature, such as is presented by Teece *et al.* (1992).

[46] Authors include Chandler (1962), Ansoff (1965), Sloan (1963) and Porter (1980; 1985).

[47] The determination of these goals and objectives rests with the top management who are required to act as generals commanding an army into battle.

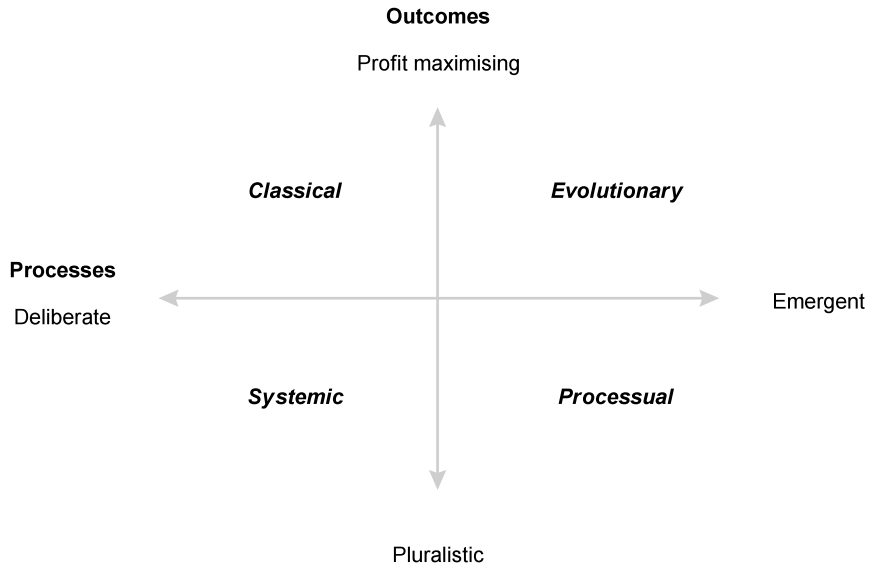


Exhibit 3.2 Four perspectives in strategy
Source: Whittington, 1993.

Evolutionary

In the Evolutionary perspective, the markets and competitive processes are the guiding force to profit maximisation. The influence that is imposed on the Classical theories by militaristic and heroic leader factors are replaced here by the biological principle of *natural selection*. Writers in this field[48] stress the role of the environment *over* that of the mangers to select winners. Markets are regarded as being too efficient to permit the creation of a sustainable competitive advantage based upon complex strategies which can only ever deliver a temporary advantage.

Processualist

For the third of the categories identified by Whittington, there is an acceptance that there are limits to the role of rational decision making. However, the Processualist do not share the confidence of the Evolutionary theorists that the market is capable of, or efficient at, selecting profit maximising outcomes. Key authors writing in this field expound[49] the view that as people are all 'boundedly rational' (i.e., they do not have the capacity to consider more than a few factors at a time and do not have perfect access to information),

[48] Authors include Henderson (1989) and Alchian (1950).

[49] Authors include Cybert & March (1963) and Mintzberg (1987).

the idea of 'adaptive rationality' - the adjusting of routines in response to signals from the external environment - becomes the basis of strategic thinking. Thus the role of *emergent strategy* becomes a critical consideration (See Exhibit 3.3).

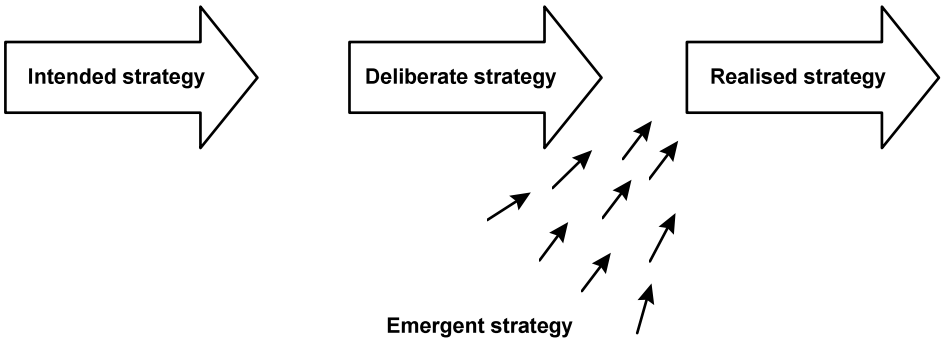


Exhibit 3.3 Development of strategy
Source: Mintzberg, 1994

Systemic

Here, a number of the basic tenets of the Classical view are shared. For example, there is an acceptance that the managers of organisations *can* plan forward and pro-actively influence their environments. However, under the Systemic view, there is an awareness of the fact that the role and actions of the managers are deeply integrated into *social systems*. Decisions are never made in a purely economic way; there will always be the influence of the social context to be considered. Key authors in this field[50] all cite examples of how the concepts of strategy, and what it actually involves, are very much culturally based. The influence of the sociological system in which the strategy is being developed and implemented is the key issue for those subscribing to the Systemic view of strategy.

The strategic contexts provided by Johnson & Scholes (1993), and the four perspectives identified by Whittington (1993) furnish us with a solid foundation upon which to build an understanding of the differing ways in which a firm is able to interact with its environment. The next stage in this review is to focus on linking consideration of the firm's growth with changes in the environment.

[50] Authors include Hu (1992), Smothers (1990), and Pascale & Athos (1986).

Strategy, growth and change

> The enterprising firm, if it is a large one, will permanently commit part of its resources to the task of investigating the possible avenues of profitable expansion, acting on the assumption, supported perhaps by past experience, that there are always likely to be opportunities for profitable growth, or that *expansion is necessary in a competitive world* (Penrose, 1959:30) (Emphasis added).

If growth becomes the basic aim (or one of the basic aims) of the firm, then it is necessary for the purposes of this research to examine the differing approaches to formulating a strategy for expansion. Before doing so, it is important to link consideration of expansion with environmental conditions.

All firms are "complex organisations operating in situations of uncertainty (or limited information)" (Clarke & McGuinness, 1987:1) which function in an environment which is constantly in a state of flux[51]. The environment within which the firms at the centre of this research were operating was one characterised by rapid and dramatic technological change, as described in Chapter 2. Such an environment presents a number of problems for effective strategic management.

> With no pre-existing 'value chain', how can one anticipate where and how money can be made in the industry, decide which activities to 'control', and know how vertically or horizontally integrated to be? (Hamel & Prahalad, 1994:44).

The shift to a new technology presents a complex problem for firms (Soukup & Cooper, 1983). In such conditions of flux, firms will seek either to cause changes in the environment, or be forced to adapt themselves in response to changes in the environment after they have occurred. These two approaches to strategy in the face of change can be labelled "pre-emptive" and "pro-active" (van der Meer & Gudim, 1992, after Gilbert & Strebel, 1988). For high technology firms operating in highly complex and rapidly changing environments typified by a fast pace of technological change, a pre-emptive

[51] A number of perspectives have emerged which attempt to deal with issues relating to such change generally, rather than the issues of strategy and success for a single organisation at a particular time in a particular industry. Strategy process research seeks to address some of these issues. Stacey (1995) provides a view of the strategic process as a response to change based on the idea that, far from striving to obtain a state of equilibrium, a system must be driven away from equilibrium where it can make use of disorder and irregularity. This view is echoed in the writings of Nonaka (1991), and Nonaka & Takeuchi (1995) on the issue of Japanese innovation strategy, when they talk of the 'use' of chaos to internally give birth to new problems.

strategy can be risky. If successful, it may result in the setting of a new product or technology standard (Morris & Ferguson, 1993)[52]. However, if unsuccessful, the result may be resources embedded in proprietary technology that finds itself chasing a diminishing market. A firm that opts for a pro-active strategy in an environment driven by fast changing technologies must rely on a high degree of organisational flexibility. Such organisational flexibility should allow the firm to react to the changes in the environment and apply or reconfigure its resources in such a way so as to derive some competitive advantage from the situation (Chesborough & Teece, 1996).

Growth and environmental change

The following section focuses on the examination of three generic growth strategies which may be employed by firms faced with a situation of wide-reaching environmental change, each of which incorporate the use of corporate acquisitions. The three strategies are; diversification, internationalisation and innovation.

Diversification and integration

The diversification options open to a firm can be encompassed by two broad classifications. The first of these is the *related diversification*. This refers to expansion beyond the present product or market, but still within the industry in which the company operates. Such related diversification can include forward and backward integration (vertical integration), and horizontal integration (See Exhibit 3.4).

For *unrelated diversification*, the firm expands beyond the boundaries of its present industry[53]. Corporate acquisitions represent a means by which a firm can shift its boundaries to allow the desired diversification to be achieved.

The writings of Williamson (1985) on transaction costs attempt to explain the *extent* to which firms will integrate. If the transaction costs can be minimised by internalising, then there will be a strong incentive to integrate. If the costs can be minimised by managing

---

[52] "Simply stated, competitive success flows to the company that manages to establish proprietary architectural control over a broad, fast-moving, competitive space" (Morris & Ferguson, 1993:87).

[53] In this way, the conglomerate enterprise - a relatively recent phenomenon in the economic world - is formed (Whittington, 1993).

activities through the free market, then there will be less incentive to integrate. Thus it is the environment that dictates the level of integration required. In addition, the potential 'synergy' effects that may emerge from both related and unrelated diversification strategies are often cited as motives for such activities. As will be shown in the later sections of this literature review, such synergy effects are an often cited motive for diversifying acquisitions, yet the high rate of failure of such ventures points to the complex managerial issues raised.

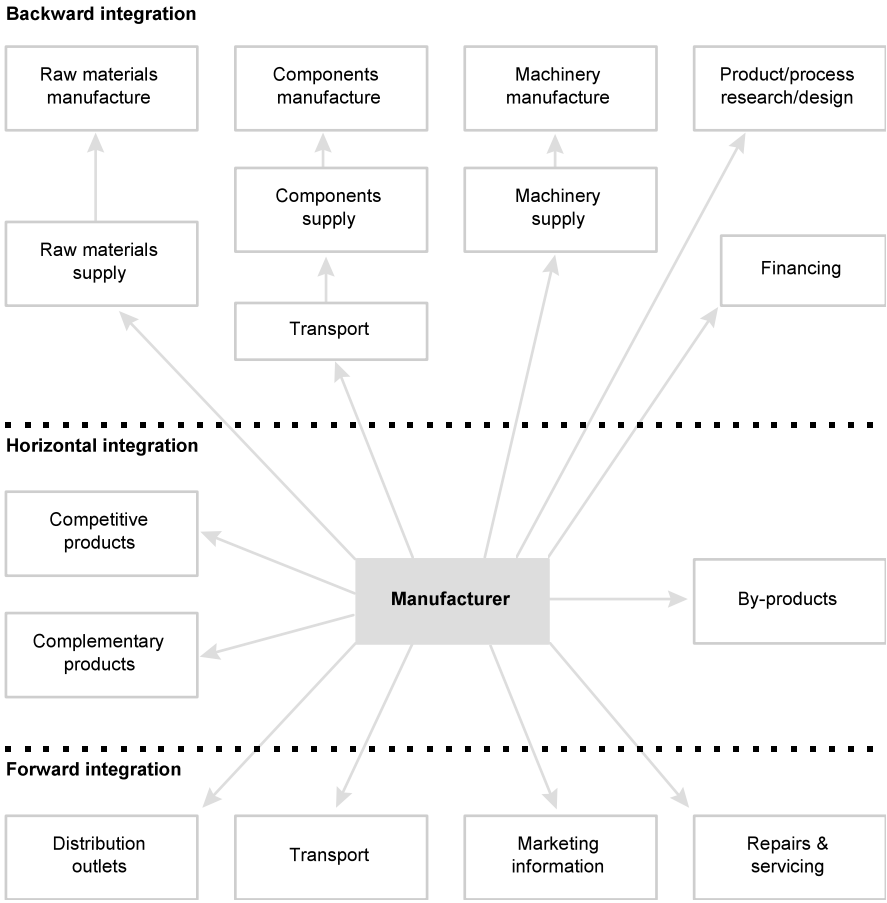


Exhibit 3.4 Organisational integration
Source: Johnson & Scholes (1993)

Internationalisation

The second growth strategy relates to the expansion of a firm's activities beyond domestic markets. A firm may wish, or be pushed by environmental conditions, to compete in international markets by exporting its goods overseas (Bartlett & Ghoshal, 1989). Beyond that, the firm may choose to move beyond merely exporting goods and internationalise some of its production (Steele, *et al.*, 1996). Such a strategy might be

formulated and implemented for a number of reasons, varying from avoidance of tariffs through to low input factor costs (Ferdows, 1993).

The transaction costs approach (Williamson, 1985) adds to the explanation of why a firm would wish to internationalise. While there are alternatives to, for example, setting up and managing an overseas manufacturing plant which would be less expensive and risk-laden (such as licensing or selling technology and brands to an overseas firm (Whittington, 1993)), there are benefits of internationalising from the standpoint of transaction costs. The need to internationalise can be viewed as a result of the 'failure' of international markets. As legal controls over international trade may not be perfect, and distortions may be introduced via customs and tariffs, firms may wish to co-ordinate their international transactions by hierarchy rather than the market (Rugman in Whittington, 1993).

The means by which a firm is able to 'internationalise' varies from the setting up of a greenfield site, through forming joint venture partnerships to the acquisition of a firm with operations in the desired location. Cross border acquisitions represent what is arguably an effective means for a firm to internationalise that avoids the problems associated with greenfield sites (length of time to become operational, supplier problems, etc.), and joint ventures (issues of control, protection, differing partner objectives, etc.). Yet, as will be discussed further in the final section of this review, there are many complex managerial problems involved when attempting cross-border acquisitions which may result in the failure to achieve strategic goals.

Innovation[54]

A firm can grow by finding new technologies to develop into new products, or by finding new ways to apply existing technologies in new products. As is discussed by von Braun

[54] **Innovation - = *invention* + *exploitation***. "The invention process covers all efforts aimed at creating new ideas and getting them to work. The exploitation process includes all stages of commercial development, application, and transfer, including the focusing of ideas or inventions towards specific objectives, evaluating those objectives, downstream transfer of research and /or development results, and the eventual broad-based utilisation, dissemination, and diffusion of the technology-based outcomes" (Roberts, 1987:3). **Technology** - "[..] is simply the body of knowledge about techniques. But it is frequently used to encompass both the knowledge itself and the tangible embodiment of the knowledge in the operating system using physical production equipment" (Freeman, 1982:4n).

(1990), the pace of this product development process and the speed at which new technologies are being diffused is accelerating. This stems from two main factors. Firstly, the technologies themselves are changing[55], and secondly, the commercialisation of these technologies - the industrial innovation process - is also changing (Rothwell, 1992). There are two bodies of literature of relevance to this particular growth strategy. The first relates to the interaction between strategy and technology and this has been contributed to by writers such as Itami and Numagami (1992), Granstrand *et al.* (1992), McGee and Thomas (1989), Porter (1985), and Wilkinson (1985;1987). These writers focus on the ways in which firms cultivate the development of new technologies within the firm, as well as the acquiring of new technologies from outside. This latter option includes a range of options from technology licensing through to the acquisition of a firm possessing the required technology.

The second body of literature focuses on issues emerging from the interaction between innovation and strategy and includes writers such as Rothwell (1992), Prahalad and Hamel (1990), Cooper (1984), Nonaka & Takeuchi (1995) and Florida & Kenney (1990). Firms will seek not only to focus on the development or acquisition of new technologies, but will seek to find ways of applying those technologies in new and imaginative ways. Firms will seek to develop an organisational culture and structure which will facilitate innovation. Such a structure may incorporate the active use of alliances and, if required, the moving of the boundaries of the firm through acquisition to encompass the knowledge and skills of an external firm.

These three growth strategies of diversification, internationalisation and innovation link consideration of the influence of the environment upon strategic options open to the firm. It can be seen how corporate acquisitions can be an integral element of each of these strategies.

---

[55] As Porter (1985) describes it; "Technological change is one of the principle drivers of competition. It plays a major role in industry structural change, as well as in creating new industries. It is also a great equaliser, eroding the competitive advantage of well-entrenched firms and propelling others to the forefront" (*Ibid.*, 164).

As the impetus driving changes in the competitive environment of the IT industry was a technological discontinuity of sufficient impact as to result in a change of industry paradigm, the role of technology and innovation can be seen to be of central importance to this research. Before focusing attention on the literature relating to innovation management, the nature of the research topic dictates that it is important for us to consider certain culture-specific issues of business strategies of Japanese firms.

Notes on Japanese business strategy

The consideration of strategic management in the face of environmental change so far has been implicitly embedded in a 'Western' business context. Earlier discussion of the systemic approaches to strategy revealed that many of the concepts of strategic management may be embedded in the social system where the strategy is being developed and implemented. As this research aims to understand issues relating to the strategies of Japanese firms, it is necessary to be aware of certain distinctive aspects of Japanese approaches to strategic management. However, consideration of Japanese strategy is embedded in an understanding of the Japanese corporate and industrial system. This system is described in more detail in Appendix I, but in summary, firms operating within this environment can be described as follows:-

> The Japanese enterprise system is an interorganizational system of business management and co-ordination. It is based on the strategic interaction and alignment of three basic forms of industrial organization - factory, firm and interfirm network (Fruin, 1992:3).

Many authors have attempted to 'explain' Japanese business strategy and to distil the essence of its success for use in other countries (Ohmae, 1982; Pascale & Athos, 1986). However, there are fundamental problems in reaching a level of distillation where any attempt at extraction is possible. As Pascale (1984) points out:-

> The Japanese don't use the term 'strategy' to describe a crisp business definition or competitive master plan. They think more in terms of 'strategic accommodation' or 'adaptive persistence' underscoring their belief that corporate direction evolves from an incremental adjustment to unfolding events. Rarely, in their view, does one leader (or strategic planning group) produce a bold strategy that guides the firm unerringly (*Ibid*., 64).

This can be seen to draw from one theme embedded in the processualist approach to

strategy. Miyazaki (1995) brings this to the foreground of the discussion by highlighting the core role in Japanese strategy of the *emergent strategy* (as also discussed by Mintzberg, 1994):-

> Japanese corporate strategies have been coherent, with organisational changes and other activities taking place over a long period, and gradually transforming the organisation to one better suited for building technological capabilities. In addition, top management in *Japanese companies have been quick to sense the changing environment, and have long been able to devise appropriate long term strategies accordingly* (Miyazaki, 1995:87) (Emphasis added).

Ohmae (1982) attributes much of the Japanese success down to the strategy of seeking out markets, functions and products which would initially avoid head-to-head competition with non-Japanese companies, and by "the tendency to look for a different battleground on which to compete" (Ohmae, 1982:240) Smothers (1990) carries these themes forward and identifies three 'motifs' of successful Japanese strategies which have aided the Japan's post-war successes (See Exhibit 3.5).

As described in Chapter 2, these strategies that have previously led the Japanese to success in global markets may be less suited to competition in a dynamic and uncertain environment. Some authors are uncertain of the suitability of Japanese strategies for competition in the new competitive environment. Porter (1996) talks of the way in which Japanese firms may have to learn a more 'Western' approach to strategy:-

> Most Japanese companies imitate and emulate one another. All rivals offer most if not all product varieties, features and services; they employ all channels and match one anothers plant configurations. [..] To [learn strategy] they may have to overcome strong cultural barriers. Japan is notoriously consensus oriented, and companies have a strong tendency to mediate differences among individuals rather than accentuate them. Strategy [..] requires hard choices (Porter, 1996:63).

This theme of 'learning new ways' is one that will be shown in later chapters to be a key factor in the analysis of the acquisitions.

Knowledge-based strategy

Striving for ever-higher ratios of value-added in products (i.e., goods services and processes) due to the multiplier of knowledge-intensive inputs (such as information, design, care or expertise) in proportion to other inputs such as mundane materials, energy or physical labour

Alliance-based strategy

With workers and stakeholders, but not with competitors, this means seeking: (a) mutually trusting, self-maintaining relationships, resulting in minimal internal and external investments in coercive control systems (including minimisation of national military expenditures): and (b) co-operative, legitimate relationships which result in 'win-win' arrangements or mutual gains

Productivity-based strategy

This means continuously moving both capital and human resources to ever-higher valued use in production processes (or service delivery systems) in conjunction with minimising non-productive investments.

Exhibit 3.5 Three motifs underlying successful Japanese corporate strategies
Source: Smothers (1990)

Having highlighted briefly the importance of consideration of certain features of Japanese business strategies, attention can now be brought back to a more in-depth consideration of one of the growth strategies described earlier - innovation.

Part II: Management of Innovation

In this section, we examine in more detail the issues surrounding the ability of a firm to innovate in response to change in a dynamic and uncertain environment driven by fast emerging technologies. The aim here is to examine the innovation process at the level of the firm[56], and to see how corporate acquisitions can be included in this process. This section is divided into four areas as follows: (1) models of the innovation process, (2) knowledge and technology, (3) organisational structure, and (4) Japanese approaches to innovation management.

Models of innovation

> Models that depict innovation as a smooth, well behaved linear process badly mis-specify the nature and direction of the causal factors at work. Innovation is complex, uncertain, somewhat disorderly, and subject to changes of many sorts (Kline & Rosenberg, 1986:275).

An awareness of the complexities of the issues relating to the process of innovation at the level of the firm can be seen in the emergence in the literature of ever-more intricate models which attempt to provide a view of the innovation process[57]. A number of

[56] This is distinct from analysis of innovation at a macroeconomic level.

[57] Rothwell (1992) has identified 5 generations of images of innovation which mark the stages of changes in perception of the innovation process since the 1950s. Horwitch & Prahalad (1976) challenge the assumption that there exists one universally applicable model of innovation. Instead, they present a generalised framework built around three 'modes'. These modes describe the manner in which innovation takes place, encompassing both processes and settings. Mode I

typologies of innovation process models can be identified from the literature and these have been summarised by Forrest (1991). The simplest of these are the *stage*, *pipeline* or *linear* models. In such models, the innovation process is viewed as a sequential linear activity taking place in a series of stages. Examples of models of this type include Utterback's (1972) 3 stage model and Pannenborg's (1986) 7-stage model (See Exhibit 3.6).

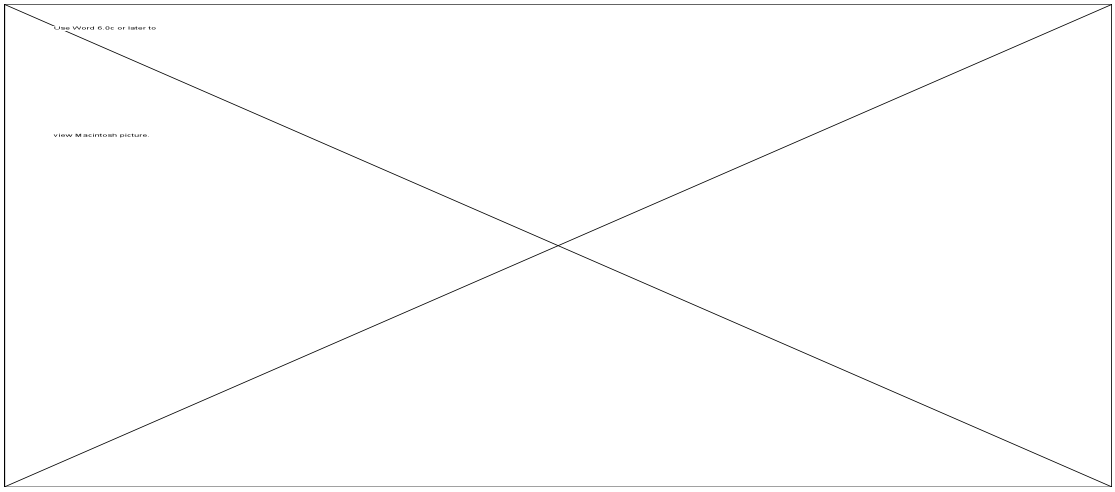


Exhibit 3.6 7-stage model of the innovation process
Source: Pannenborg (1986)

In the second typology of the *conversion* model, innovation is described as a conversion process with inputs being transformed through a number of steps into products. Twiss (1992) provides a simple example of such a model. A more representative model (an 'interactive' model) is given in Rothwell (1992) (See Exhibit 3.7).

is the technological innovation process found in small, high-technology firms. Mode II is technological innovation in large multi-market, multi-product corporation. Mode III the technological innovation in the multi-organisation and multi-sector enterprise.

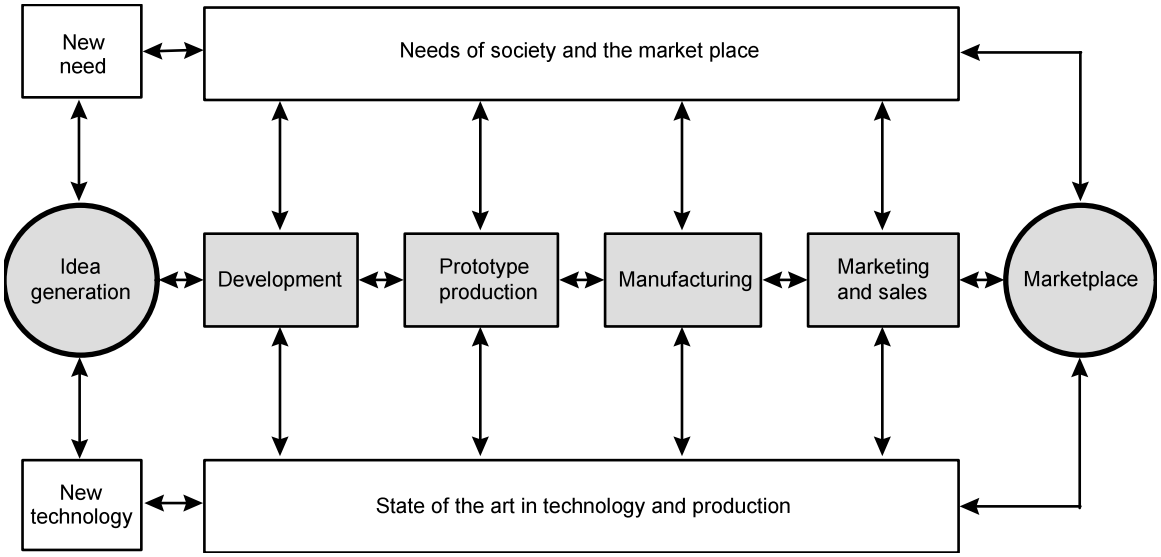


Exhibit 3.7 Interactive model of the innovation process
Source: Rothwell (1992)

The remaining typologies encompass the *integrative* model (models which attempt to integrate all the facets of the innovation process including the changing characteristics of the innovation process as the firm grows and develops over time (Utterback & Abernathy (1978) and Schmidt-Tiedemann (1982)); the *decision* models (which view the innovation process in terms of key 'decision points' (Cooper & More, 1979); and the *biological analogy* (where the organisation is viewed as an adaptive open system readily monitoring its environment[58] (Martin, 1984)).

The complex nature of innovation, and the wide variety of contexts in which it occurs makes the task of modelling the process with any degree of realism almost impossible. However, models do provide a framework for visualising the interaction between the key inputs, outputs and variables within the innovation process, and places them in their appropriate contexts. Certain additional factors, such as the role of corporate acquisitions, while not explicitly a part of the models, can be included by viewing them as a method to enhance the firm's store of knowledge and technology.

[58] The innovation process here is regarded as a 'technological mutation', with products and processes evolving as new knowledge is obtained from the market and technological environments, thus enabling a technology-market synergy to occur. As the environment provides new knowledge for the organisation, technological mutations will occur.

Knowledge, technology and innovation

The innovative capacity of the firm can be regarded as being dependent on the richness of the firm's knowledge base. This knowledge base encompasses both *tacit* and *explicit* (or *articulated*) knowledge (See Exhibit 3.8). The knowledge base, coupled with the 'hard' resource base of the firm, will dictate to a large extent how effectively the firm is able to achieve some competitive advantage over its competitors (Nelson & Winter, 1982; Kline & Rosenberg, 1986; Nonaka, 1990; Nonaka & Takeuchi, 1995; Senker, 1995). A firm will seek to augment its knowledge base by refining what it has already internalised, and by reaching into the environment - into its industry or the wider external environment of society generally[59].

Tacit knowledge (Subjective)	Explicit knowledge (Objective)
• Knowledge of experience (body)	• Knowledge of rationality (mind)
• Simultaneous knowledge (here and now)	• Sequential knowledge (there and then)
• Analogue knowledge (practice)	• Digital knowledge (theory)

Exhibit 3.8 Two types of knowledge
Source: Nonaka & Takeuchi, 1995

The strong link between tacit knowledge and innovation is summed up by Senker (1995) as follows:-

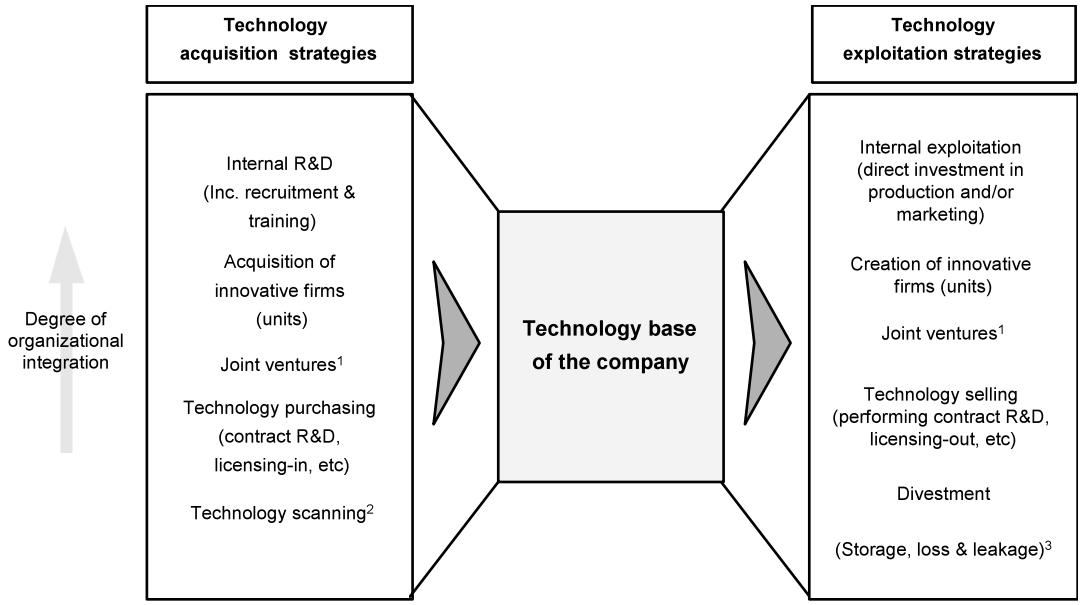
> [..] continuing dependence on tacit knowledge for innovation arises from the tendency for advances in knowledge and techniques to be associated with new tacit knowledge; from adherence to previous successful practice; from the lack of scientific or technological expertise within specific firms or sectors; and, possibly most commonly, from the complexity of systems. Vincenti's (1990) observation that uncertainty diminishes as a technology becomes older suggests a fourth category where tacit knowledge is of importance: in the emergence of new technologies (*Ibid*., 431).

A specific form of knowledge a firm possesses is embodied in its *technology*[60]. For

[59] "Information about the activities and methods of other firms can be obtained by a variety of means - by buying and studying their products; by hiring away their technically expert employees; by reading accounts of their activities in trade journals, reports of securities analysts, and their mandatory filings with government agencies; by hiring consultants who work with the other firms of the industry as well; by reading copies of their patents or the publications of their research scientists; by overt purchase or exchange; or by covert schemes of industrial espionage." (Nelson & Winter, 1982:64).

[60] As defined earlier, technology is: "[..] technology is simply the body of knowledge about techniques. But it is frequently used to encompass both the knowledge itself and the tangible embodiment of the knowledge in the operating system using physical production equipment." (Freeman, 1982:4n).

Clarke *et al.* (1989), the three key factors relating technology to the innovative ability of the firm are the acquisition of technology, the management of technology and the exploitation of technology. These points are then amplified by Granstrand *et al.* (1992) who provide a typology of generic 'technology strategies', based on the coupling of technology acquisition with technology exploitation (See Exhibit 3.9).



Notes:
1. Joint ventures refer to inter-firm R&D co-operation in general, not necessarily formalised - e.g. links with sub-contractors.
2. Scanning includes legal and illegal forms of acquiring technological know-how from outside without any direct purchasing from its original source.
3. This is not a strategy for exploitation but a kind of residual of unappropriated technology, possibly leaking to competitors through their technology scanning efforts.

Exhibit 3.9 Technology strategies
Source: Granstrand *et al.* (1992)

By viewing innovation in terms of its relationship with organisational knowledge and technology, the role of corporate acquisition can be identified within the innovation process. This points to wider consideration of the ways in which a firm's structure, and in particular how external and internal technology and skills are combined, is linked to the ability to manage innovation.

Organisational structure and the use of alliances

The structure of a firm has been identified as having a strong influence on its ability to innovate (Morgan, 1986; Twiss & Goodridge, 1989; Schoonhoven & Jelinek, 1990;

Pavitt, 1991;1992; Nonaka & Takeuchi, 1995). While no 'ideal' structure which optimises innovative ability can be identified, there are certain features of an organisation's structure which will affect its innovative ability.

> The innovative organisation needs to behave in many ways like the small entrepreneurial venture company, yet take full advantages of the benefits of size and large resources (Twiss & Goodridge, 1989:27).

For firms operating in high technology industries, particular features of the successfully innovating organisation have been identified:-

> These firms show a consistent pattern of structure - formal, quasi-formal and informal - that actively facilitates both innovative ideas and task-relevant co-operation. While they have thousands of employees, these companies clearly organise for innovation, they re-organise for innovation and they retain the small company flavour by carefully fostering patterns of interaction usually associated with small companies. [..] The dynamic tension between all these elements is an important component of the management of innovation (Schoonhoven & Jelinek, 1990:117).

Faced with a dynamic and uncertain environment driven by fast emerging technologies, firms may be forced to find ways to access external sources of technology and knowledge. As Teece (1992) discusses, analysis of the innovative abilities of the firm as a discrete entity has become increasingly difficult:-

> Discussions of the link between firm size and innovation are outmoded because the boundaries of the firm have become fuzzy in recent decades. Strategic alliances[61] - constellations of bilateral agreements among firms - are increasingly necessary to support innovative activities (Teece, 1992:1).

This use of external organisations to enhance the innovative capacity of a firm is also discussed by Forrest (1991), and Bidault & Cummings (1994). The latter authors present the view that there is a tension between the dynamics of innovation and the logic of partnering that may cause sufficient managerial obstacles so as to offset the planned benefits of co-operation. The main justifications for entering alliances as a means to foster innovation can be summarised as follows:-

1. Alliances may appear as a faster and cheaper way to develop new products and processes.
2. Co-operative R&D allows partners to reach a critical mass of human and financial resources

[61] Alliances encompass here a range of strategic options of loose co-operative marketing and distribution agreements, through joint venture agreements, to complete internalisation of the resources of an external organisation, i.e., a 100%

needed to undertake large projects.

3. Merging technological knowledge and skills from different companies improves the innovation process (Bidault & Cummings, 1994:33).

However, these benefits may not be realised owing to the fundamental tension that exists between the dynamics of innovation and the logic required for partnering to be a success. Innovation stems from creativity, uncertainty and risk-taking. Partnering, on the contrary, emphasises clarity and explicitness:-

> The inherent nature of the two processes definitely seem incompatible: on the one hand, a co-operative agreement should be as specific as possible, while on the other, we can characterise innovation management, to a large extent, as an ambiguous and non-linear process (Bidault & Cummings, 1994:41).

It can be viewed that the use of 'loose' strategic partnering to enhance a firm's ability to innovate may not be an ideal solution in all cases. It may be that tighter linkage between internal and external skills and technologies may be more appropriate. The acquisition of ownership of an innovative firm can be regarded as a strategic option which extends the boundaries of the firm (and consequently its knowledge base) without certain complexities of looser partnerships (Granstrand *et al.*, 1992; Chakrabati *et al.*, 1994). However, the specific managerial difficulties that acquisitions pose have meant that firms may in preference seek out joint venture partners rather than acquisition targets when seeking to internalise certain intangible resources:-

> Internalisation via collaboration may be more attractive than acquiring a firm in total. In buying a company the acquirer must pay for non-distinctive assets, and is confronted with a substantially larger organisational integration problem (Hamel, 1991:99).

Exhibit 3.10 provides some examples of issues that firms must address in selecting between alliance partner or acquisition target.

	Strategic/JV alliance partner	**Acquisition target**
Commitment	"Easy to make, easy to divorce"	Once investment made, cost incentive to integrate successfully.
Value	Can result in win-win situation.	Act of acquiring can destroy the

take-over of ownership.

		value.
Control	If 50:50 split, can cause problems for decision making.	Control lies firmly with the acquirer.

Exhibit 3.10 Typical considerations of *alliance partner* versus *acquisition target*

It becomes clear that faced with an uncertain and dynamic environment driven by fast emerging technologies, firms must develop strategies *and* organisational structures that allow them to adapt and react to changes rapidly. In a complex environment, innovation requires the flexibility of a small firm linked to the capital and capacity of a large firm. 'Looser' alliances form one solution to this paradox, but alliances in themselves present a series of problems, and may be inappropriate for the effective management of innovation. Tighter control over external technologies may be more appropriate. Acquisition of ownership of an external firm possessing the technology or skills required provides one means to achieve this tighter control. Before turning the focus of attention to consideration of the managerial issues that the use of acquisitions raises, it is important here to consider the specific issues relating to Japanese approaches to the management of innovation.

Japanese approaches to innovation management

Much of the writing on the subject of Japan and innovation at the level of the firm unavoidably polarises the discussion into generalised comparisons of the 'Japanese' and 'Western' models of the innovation process. What becomes clear after examination of the main body of literature written on the subject is that there are a number of features of the Japanese industrial and corporate system that have lead to new product development and innovation at the level of the firm differing from the perceived generic 'Western' way.

Bowonder & Miyake (1992) present a summary of a number of views of Japanese innovation which have contributed to the formulation of various 'Japanese' models. These views seek to highlight features of the Japanese industrial system, organisational structure and corporate strategy which are perceived to have contributed to the continued success of Japanese high technology firms at producing streams of innovations. See Exhibit 3.11.

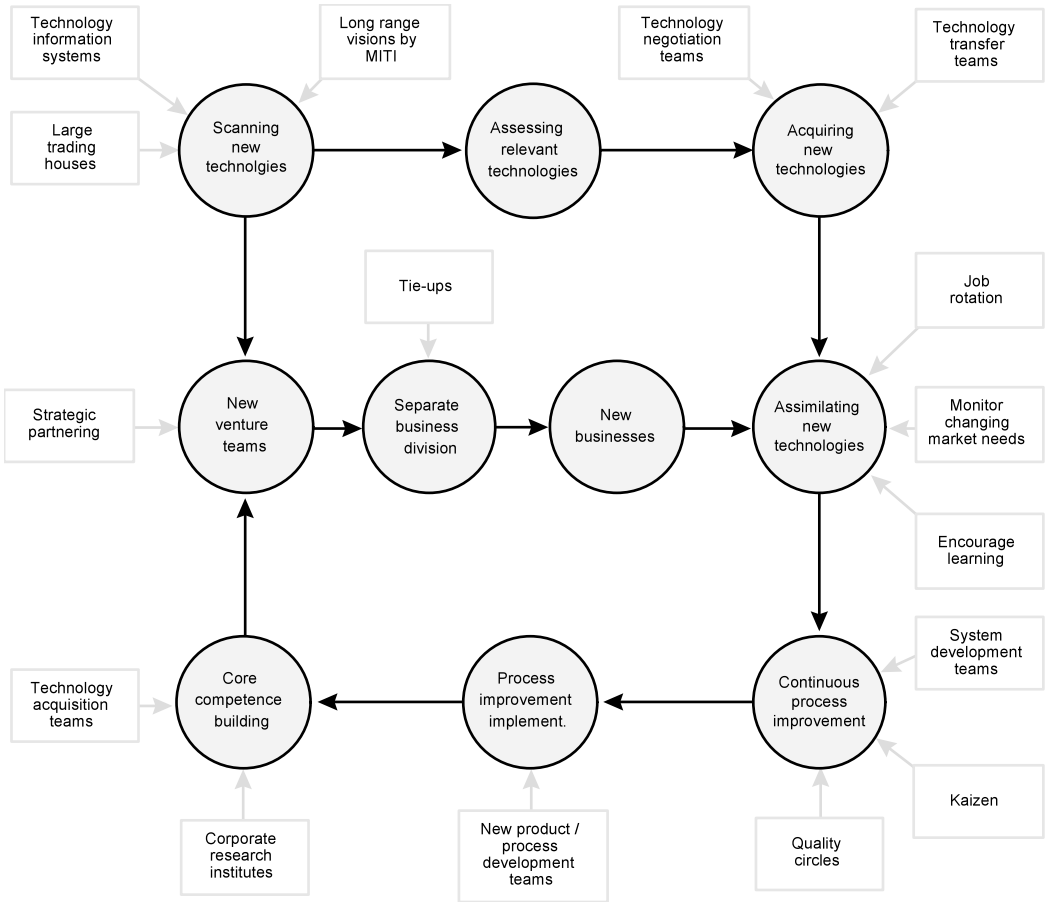


Exhibit 3.11 The Japanese innovation process
Source: Bowonder & Miyake, (1993)

Bowonder & Miyake (1993) continue this analysis of the innovation process within Japanese firms by characterising seven key features:-

- *Emphasis on commercial utilisation*. Japanese firms stress the commercial end of the innovation spectrum. Quick commercialisation of innovative ideas developed elsewhere needs strong interaction between functions such as design, engineering, testing, manufacturing and marketing (Gomory, 1989; Florida & Kenney, 1990;1993[62]).
- *Intensive diffusion of technologies*. Japanese firms place considerable emphasis on

[62] For Florida & Kenney (1990, 1993) one of the key factors in Japan's success is the focus on 'follow-through' innovations, i.e., maintaining a steady stream of innovative products, as opposed to focusing efforts on achieving technological 'breakthroughs'. For Gomory (1989) the focus of Japanese innovation can be placed on the ability of firms to view innovation in terms of a 'product cycle', i.e., emphasis placed on incremental improvements and the continuous turning out of new products, as opposed to the 'ladder' view of innovation, which describes the step-by-step reduction to practice of new scientific knowledge that then generates a radically new product.

rapid technology diffusion. This requires a high level of functional co-ordination and continuous technological improvements or product modifications. Large trading houses play a key role in facilitating diffusion and utilisation of market information.

- *Emphasis on incremental innovation*. Regular product and process improvement is only possible through intensive co-ordination and interaction of functional managers dealing with R&D, design, engineering, manufacturing and marketing. *Kaizen* (the gradual, unending cycle of improvements) facilitates functional interaction and rapid exchange of information across functions.
- *Multiple competence technologies*. Many of the recent Japanese innovations have been in areas requiring multiple skills to integrate advanced technologies (Prahalad & Hamel, 1990). This can also be seen in the work of Kodama (1990;1992) on *technology fusion* within Japanese firms.
- *Morphogenetic logic*. Maruyama (1985) and Tatsuno (1990) discuss the way that Japanese thinking follows morphogenetic logic, whereas Western thinking is based on Aristotelian logic. This has been much discussed in relation to the transferability of Japanese innovation management methods (Pascale & Athos, 1986).
- *Integration of marketing and innovation*. The use of multiple marketing channels (such as trading houses, marketing subsidiaries and direct selling) helps to differentiate users while also achieving a high degree of co-ordination in terms of market planning. This integrated marketing function provides market intelligence as well as feedback information from users (Kotler *et al.*, 1985).
- *Organisational learning*. A major characteristic of the Japanese innovation process is the rapid assimilation of technology (Nonaka & Takeuchi, 1995). The linking of skills through rapid organisational learning is the result of functional integration. Corporate networking facilitates functional integration, while also helping in the creation of new skill groups through creative organisational learning processes.

The view of the innovation process within Japanese firms (given in Exhibit 3.11) can also be seen to highlight the role of technology and knowledge acquisition. The ways in which

this technology is acquired range from technology licensing through joint venture partnering, to the acquisition of innovative firms (Granstrand & Sjölander, 1990; Granstrand *et al.*, 1992). But, as Bidault & Cummings (1994) discuss, the use of the 'looser' partnerships with external firms can be incompatible with the dynamics of innovation. Tighter control, or internalisation of the source of the technology or skill through acquisition may provide a more effective means to augment the ability of the firm to innovate. However, it is necessary to consider the complex managerial issues raised by the use of acquisitions.

Part III: Management of Acquisitions

It has been well documented that a high percentage (50-80%) of acquisitions 'fail'[63] (Kitching, 1967; Meeks, 1977; Napier, 1989; Mujtaba, 1990; Cartwright & Cooper, 1990; Schweiger *et al.*, 1993; Elsass & Veiga, 1994). Yet acquisitions, owing to a number of factors, remain a strategic tool widely used by firms to grow[64].

Recent literature has focused on the problems of integrating the two organisations following an acquisition as being a major cause of acquisition failure (Jemison & Sitkin, 1986a;1986b; Buono & Bowditch, 1989; Cartwright & Cooper, 1990; Haspeslagh & Jemison, 1991). Such literature seeks to redress the bias of research attention towards the pre-acquisition strategic and financial considerations, and the negotiation process[65]. However, to gain a richer picture of the complex activity of acquisition suitable for the purposes of this research[66], it is necessary to take an approach to viewing acquisitions that includes consideration not only of strategic fit, organisational fit, integration management and human resource issues, but also an understanding of the management of the complete *process* of acquisition. In this section, the aim is to provide an overview to

---

[63] The 'failure' of an acquisition is taken from Kitching (1967) to be (a) the actual financial results following the acquisition to not reach the expectations of the projected figures from before the acquisition or (b) a qualitative assessment of acquisition as compared with the original strategy which shows a mis-match.

[64] Such factors include: (1) market conditions, (2) increasing availability of capital, (3) more companies for sale, (4) the easing of regulations, (5) the need to share risk, (6) the existence of 'complex indivisible problems', and (7) the unrecognised psychological motives for acquisitions (Cartwright & Cooper, 1990).

[65] See Auerbach (1988), Weston *et al.* (1990).

[66] The financial considerations in relation to acquisitions are not within the scope of this research.

the literature relating to these areas and to summarise the particular problems faced by Japanese corporations when using acquisitions.

Acquisition types

As discussed earlier, corporate acquisitions represent one of a number of ways in which a firm may grow, and they can be classified by a number of criteria[67]. For the purposes of this research, the integrated typology of acquisition type provided by Buono & Bowditch (1989) will be used for classification purposes (See Exhibit 3.12).

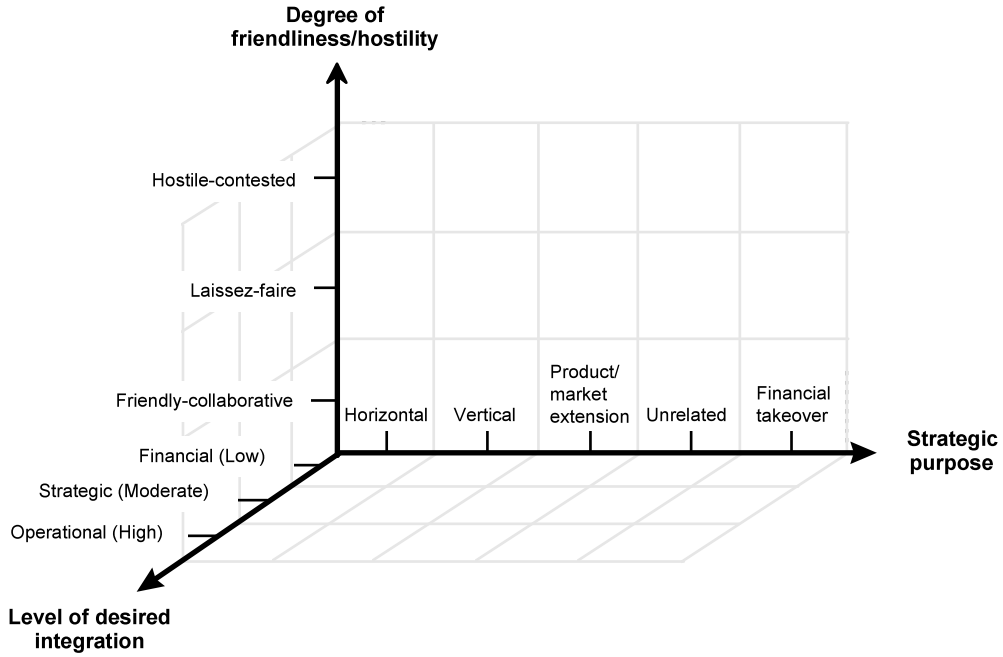


Exhibit 3.12 An integrated typology of acquisitions
Source: Buono & Bowditch (1989)

The acquisition process

Acquisitions tend to follow a fairly predictable sequence of steps and various labels can be applied to these stages (See Exhibit 3.13). The image of likening the process of

---

[67] Kitching (1967) provides four main types based on the way in which the activities of the acquiring firm relate to those of the acquired firm: *Vertical* (the combination of two organizations from successive processes within the same industry); *Horizontal* (the combination of two similar organizations in the same industry); *Conglomerate* (where the acquired organization is in a completely unrelated field of business activity); and *Concentric* (where the organization acquired is in an unfamiliar but related field, into which the acquiring company wishes to expand).

Various other forms of classification include Napier's (1989) grouping on the basis of degree of integration required for the desired acquisition outcomes to be achieved: *Extension mergers* (where the acquiring organization does not intend to change, other than perhaps minimally, the way in which the acquired business transacts its business); *Collaborative mergers* (where success is dependent upon the integration of operations ('synergy' mergers) or exchange of technology or other expertise ('exchange' mergers)); and *Redesign mergers* (where the acquiring organization intends to introduce wide-scale changes whereby the acquired totally adopts the practices and procedures of the acquirer).

acquisition to a marriage was developed by Levinson (1970) and has been popularised by various authors seeking to highlight the 'softer' issues involved in acquisitions. An awareness of the importance of integration planning within the complete process, rather than biasing attention on the pre-acquisition stages is now realised by both practitioner (McDermott-Brown & Hargreaves 1991) and academics alike to be crucial to a successful acquisition outcome:-

> The lack of careful research attention to the problems of post-acquisition integration appears to reflect the difficulty in recognising the process itself as part of the problem. [..] An emphasis on process does not imply a rejection of the [strategic] choice perspective as an important determinant of acquisition outcomes. To the contrary, strategic analysis may be a necessary condition for success in all acquisitions, and organisational fit may also be a necessary condition in related diversification acquisitions. [..] (Jemison & Sitkin, 1986:148).

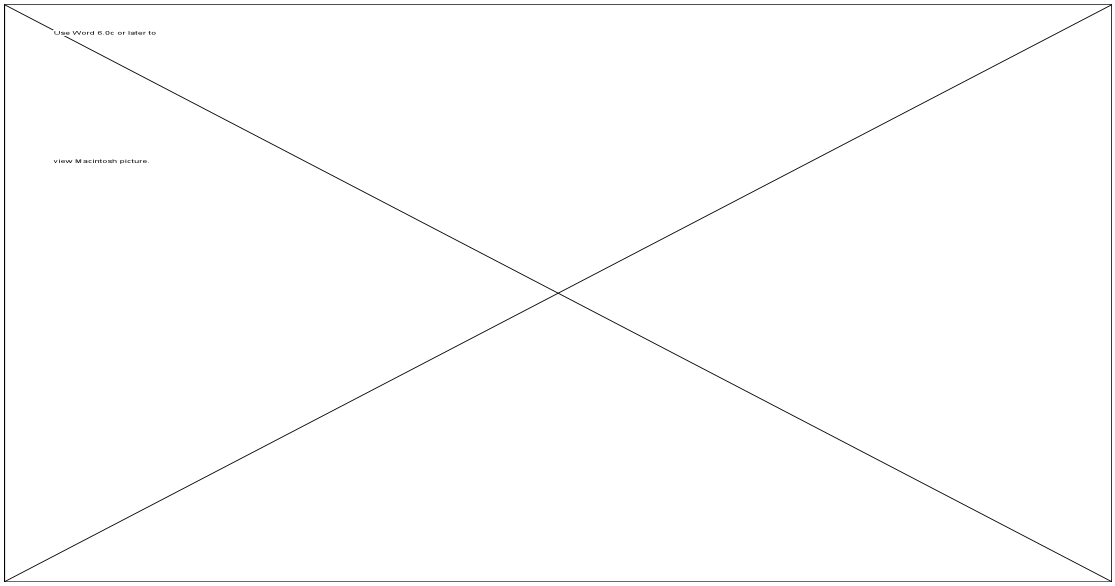


Exhibit 3.13 Acquisition stages
Source: Adapted from Cartwright & Cooper, (1990)

Strategic fit

A number of authors stress the importance of a good 'strategic fit' between the target and acquiring firm for a successful acquisition outcome. This strategic fit is described by Jemison & Sitkin (1986) as follows:-

> [..] the degree to which the target firm augments or complements the parent's strategy and thus makes identifiable contributions to the financial and non-financial goals of the parent (*Ibid.*, 146).

Firms who successfully acquire are viewed as being skilful at identifying ways in which

the resource of an external firm will be combined with those of the acquiring organization to create additional value. One means by which additional value may be created is through the achievement of 'synergistic benefits', or the '2+2=5 effect' (Kitching, 1967; O'Rourke, 1989), that are anticipated following the integration of the acquisition[68]. Such anticipated benefits form one of a list of possible strategic motives for acquisitions, which can themselves be grouped in two broad categories (Napier, 1989); (1) financial or value maximising motives, and (2) managerial or non-value maximising motives. Value maximising motives encompass all those that are aimed at creating added value for shareholders, such as increasing synergy through economies of scale, transferring and distributing knowledge from one organisation to another, and the transfer of new management to the acquired unit to release unrealised potential. Non-value maximising motives describe those which are aimed at increasing market share or asset growth, increasing management's power and reducing uncertainty in a firm's external environment.

While consideration of strategic fit are essential in the acquisition process, it provides only one part of the complete activity. Consideration of how the two organisations will fit together is also a major consideration in ensuring a successful acquisition outcome (Cartwright & Cooper, 1990).

Organisational fit

Consideration of the compatibility of the two organisational structures and systems when integration is attempted stems from an awareness and understanding of the role of culture:-

> While it is clear that successful mergers and acquisitions must be based primarily on strategic, financial, and other objective criteria, ignoring a potential clash of cultures can lead to financial failure or at least a substantial diminution of expected results. Far too often, personnel and organisational issues are assigned a low priority during the pre-acquisition evaluation process. Other times, they are an afterthought. *Increasing evidence suggests that cultural incompatibility is the single*

[68] The issue of synergy is one which raises much discussion in the literature (Kitching, 1967; Nahavandi & Malekzadeh, 1988; Senn, 1989). Kitching (1967) was one of the first to highlight the fact that the existence of *potential* synergy is no guarantee that this extra benefit will *actually* be released by the joining of the two firms.

> *largest cause of failure to achieve projected performance*, [..] (Senn, 1989:229) (Emphasis added).

The issues relating to culture can be broken down into three areas: (1) national, (2) organisational, and (3) technological (Garnsey *et al.*, 1992).

National Culture

Although modern cultures are growing to share much in common, it is not possible to dismiss cross-national differences as insignificant (Morgan, 1986). Whenever two national cultures come into contact, there will almost inevitably be "culturally frustrating incidents" (Osigweh *et al.*, 1993). Underlying values, such as those of equal opportunity, reward based on performance and selection on merit, are biased by national culture (Laurent, 1986). Dealing with the "confusion and distrust in day-to-day interaction" (Garnsey *et al.*, 1992) can be a major problem in integrating cross-border acquisitions.

Organisational Culture

Schein (1985) defined organisational culture as:-

> [..] a pattern of basic assumptions - invented, discovered or developed by a given group as it learns to cope with its problems of external adaptation and internal integration - that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think and feel in relation to those problems (*Ibid*., 9).

A company's culture might be likened to a person's personality (Senn, 1989). Just as with individual personalities, a company's culture can be thought of as being made up of collective values, customs and unwritten rules that govern behaviour within the organization. Once this image of an organisational culture being likened to an individual's personality is used, the complexity of the situation that arises when two cultures attempt to combine in the same way that two personalities come together through the process of marriage becomes obvious:-

> Two companies merging based only on financial data is like two people marrying based only on height, weight, and vital statistics; both lead to a high divorce rate (Senn, 1989:229).

Despite an increased awareness of the importance of corporate culture in organisational management, the issue of how to merge two differing cultures still represents a complex managerial challenge (Senn, 1989; Cartwright & Cooper, 1990; 1992). This can be illustrated clearly by comparing examples of the systems and structures of starkly

differing organisational cultures (See Exhibit 3.14).

Technological Culture

High-technology companies, especially small ones, often have their own idiosyncratic cultural environment in which new ideas are generated and transformed into products (Garnsey *et al.*, 1992). When a small firm with its informal procedures is then taken over by a larger firm with more clearly defined routines, procedures and organisational culture, the creativity of the smaller unit may be swamped and lost. This can be one of the hardest integration problems to deal with following an acquisition (O'Rourke, 1989).

Style A	***Style B***
• Seniority-based compensation and promotion. • Conservative, risk-averse. • Cost- and control-driven. • Long-range planning & deliberate decision-making. • Analytical, cautious. • Autocratic.	• Performance-based compensation and promotion. • Innovative, risk-taking. • Service- and quality-driven. • Opportunistic, rapid decision making. • Intuitive, daring. • Participative.

Exhibit 3.14 Potentially conflicting organisational cultures
Source: Senn (1989)

Post acquisition integration

Integration forms one of the most problematic areas of acquisition management (Johnson & Scholes, 1993) and is defined by Haspeslagh & Jemison (1991) as follows:-

> Integration is the interactive and gradual process in which individuals from two organizations learn to work together and co-operate in the transfer of strategic capabilities (Haspeslagh & Jemison, 1991:105).

Schweiger *et al.* (1993) describe the problems that can emerge from ineffective integration (implementation):-

> [Acquisitions] if not properly managed can create overly dysfunctional and organizational outcomes such as lower productivity, loyalty to the company, job satisfaction and higher stress, turnover and absenteeism. Moreover, [..] the integration of two companies can lead to destructive interpersonal and inter-group conflict. The combined net effect of these factors is an ineffective, if not aborted implementation (Schweiger *et al.*, 1993).

The awareness of the importance of organisational and cultural issues when integrating two organisations and in reaching a successful acquisition outcome is discussed in detail by authors such as Nahavandi & Malekzadeh (1988), Buono & Bowditch (1989), Napier, (1989), Cartwright & Cooper (1990; 1992), Haspeslagh & Jemison (1991), Schweiger *et al.* (1993), and Elsass & Veiga (1994). Haspeslagh & Jemison (1991) provide a model to help understand the dynamics of the integration process (See Exhibit 3.15). This model presents the process in terms of creating an appropriate atmosphere for capability transfer which will lead to improved competitive advantage.

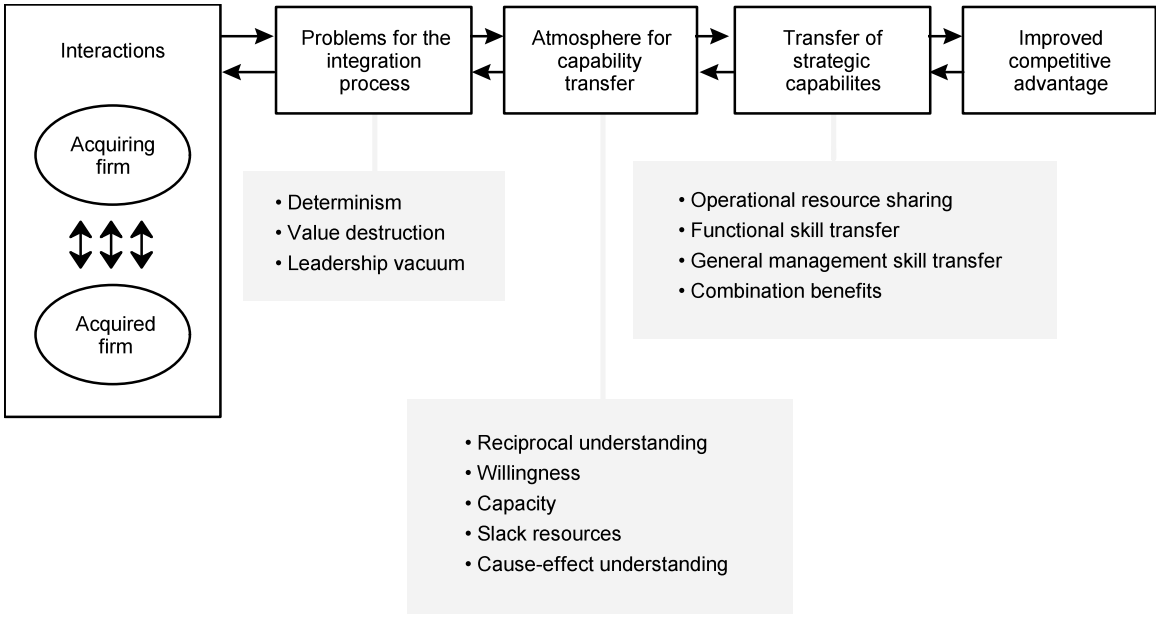


Exhibit 3.15 The acquisition integration process
Source: Haspeslagh & Jemison (1991)

The creation of an appropriate atmosphere for integration requires consideration of a number of factors[69]. If this atmosphere can be created, then the transfer and application of strategic capabilities should be facilitated. Three groups of recurring integration process-based problems have been identified by Haspeslagh & Jemison (1991). These are as

[69] Such factors may include:

- A reciprocal understanding of each firm's organisational culture.
- The willingness of people in both firms to work together after the acquisition.
- The capacity to transfer and receive capability.
- Discretionary resources to help foster the atmosphere needed to support the transfer.
- A cause-effect understanding of the benefits expected from the acquisition (Haspeslagh & Jemison, 1991).

follows:-

1. *Determinism* - the tendency to cling to the original justification in the face of a different or changing reality confronting the acquisition.
2. *Value destruction* - the impact of acquisition in individual managers and employees themselves.
3. *Leadership vacuum* - the lack of appropriate leadership to articulate a new purpose for the combined firms.

In response to such problems as these, Schweiger *et al.* (1993) propose three means by which firms may integrate.

- *Assimilation* refers to the situation when one organisation adopts some or all of the identity of the other. This process can either be forced or voluntary. Forced assimilation is often driven by the buying firm's 'superiority syndrome', but such an integration strategy may be required when the acquired firm has performed poorly in the past or is resisting change.
- *Novation* occurs when two organisations are combined and a new identity is created. This form of integration may be highly desirable, but can prove costly in both time and money as *both* organisations are required to change.
- *Structural integration* allows the combining organisations keep their own 'identity'. Firms taking this approach to integration face the problems that may stem from a requirement for heightened tolerance on the part of members of both organisations to accept the validity of each others working practices.

Consideration of the post-acquisition integration issues provides us with an indicator of the complex managerial issues that must be considered when one organisation merges with another. Practitioners point to the need for consideration of integration issues to be included in *all* stages of the process[70].

[70] **Pre-acquisition phase**. Acquiring firm should have clear idea of its own 'cultural profile' along with a profile of a

Thus the elements of strategic fit, organisational fit, integration management, human resource issues and an understanding of the management of the complete process of acquisition combine to form a holistic view of the management of acquisitions. Viewing acquisitions in this way helps to highlight the complex managerial issues raised if the acquisition is to be successfully implemented. For cross-border acquisitions by Japanese firms, there are an additional series of factors that must be considered.

Use of acquisitions by Japanese firms

It has been well documented that Japanese firms have a different attitude towards M&A when compared with their Western counterparts (Schlosstein, 1989; Windmill & Mendelssohn, 1990; Kester, 1991):-

> Unlike [Western] firms, which tend to diversify by way of take-overs and mergers, most Japanese companies have followed an in-house approach to developing new products and services. [..] internal product diversification is more risky and time consuming than restructuring through acquisitions. But an external acquisition in Japanese means merging two closed and exclusive corporate families, each with its own well-established hierarchy and social system (Yuzawa, 1994:72).

This reticence to use corporate acquisitions stems from a number of factors which are discussed briefly in the following sections.

Corporate governance

The Japanese system of corporate governance[71] has been a major influence on the way in which Japanese firms have regarded M&A:-

> This system, more than anything else, has decisively influenced Japanese merger and acquisition activity throughout the country's modern economic history. It has largely obviated the necessity for deep and active market for corporate control at home, limited the activity of Japanese companies in the market abroad, and yielded a paucity of attractive targets for foreign bidders. It has also produced

---

typified organisation with which managers feel they could work. The profile of a potential target could be one that is similar to the acquirers, or deliberately different to support new strategic directions.

Due diligence phase. Acquirer should gain insight into target's: Management (calibre of key managers, style, managerial values, direction and control); Organisation (structures systems and functions); Climate (environment, responsiveness to change, extent of employee involvement and union representation).

Post-acquisition phase. Acquirer should implement a planned process of integration that includes: Communication plans and strategies; Organisational structure and reporting relationships; New vision, mission and values development plans; Personnel plan, dealing with benefits and compensation (Senn, 1989; McDermott-Brown & Hargreaves, 1991).

[71] Corporate governance is used here to describe the "entire set of incentives, safe-guards and dispute resolution processes that orders the activities of various corporate stakeholders, each seeking to improve its welfare through co-ordinated economic activity with others" (Kester, 1991). Appendix I provides a more detailed examination of the Japanese system of corporate governance.

> a distinctly Japanese standard for those acquisitions that do take place (Kester, 1991:5-6).

The key features of the Japanese system of corporate governance can be described as (1) implicit contracting founded on trust[72], (2) extensive reciprocal shareholdings and implicit reciprocal trade agreements with a few key stakeholders, (3) managerial incentives aligned toward overall corporate growth and away from transfers of value among stakeholders, and (4) early intervention by key stakeholders, especially main banks (See Appendix I).

Schlosstein (1989) relates the issue of growth versus profit as a managerial goal within Japanese firms to the consequent focus on non-value maximising motives for acquisitions that do take place in Japan:-

> The fundamental objective underlying the execution of mergers and acquisitions in the United States is financial - maximising shareholder value. In Japan and East Asia, however, the fundamental corporate objective is strategic - maximising market share (*Ibid.*, 311).

Many of the acquisitions that take place in Japan tend to be among firms already related by virtue of their existing *keiretsu* connections (Senn, 1989). Acquisitions by original equipment manufacturers (OEMs) of their component suppliers in which they already have an equity stake is one example of how Japanese firms may use acquisitions within the domestic market.

Culture

For Japanese firms, people are arguably viewed as the most important asset, rather than its products or its plant and equipment (Schlosstein, 1989). Added to this is the view of the 'company-as-family' (Kester, 1991). Consequently, any attempt to buy and sell companies carries with it unsavoury moral connotations of 'flesh-peddling'. Even the language used to describe M&A activity is laden with negative imagery for the Japanese. e.g., *nottori* - also used to mean hijacking, and *baishu* - used to imply bribery. The view of the company functioning as a microcosm of society as a whole, with unique

[72] The concept of implicit contracting is one which has bearing upon the use of acquisitions by Japanese firms. As Cartwright & Cooper (1992) discuss, this ties-in with the Japanese decision-makers being heavily influenced by the opinions and judgements of operational managers. This contrasts with the UK and US preference for leaning towards the views of legal advisors and consultants in the negotiation phase of an acquisition.

hierarchies and internal factions is discussed by Schlosstein (1989) in relation to the difficulties encountered when Japanese firms combine[73].

Acquisitions, when they do take place in Japan, are often forced by near bankruptcy or business failures (Schlosstein, 1991). Consequently, there is often a 'losers stigma' attached to acquisitions[74]. Hostile bids are very rare and one of the major reasons given is the desire among Japanese firms working together to achieve 'harmony'. If an acquisition were to be hostile, then it would be very hard for firms to work towards common goals following the acquisition (Kester, 1991).

International acquisitions

A number of motivating and restraining factors are given by Kish & Vasconcellos (1993) in relation to Japanese cross-border acquisitions. On the positive side (as discussed in Chapter 1) are factors such as exchange rate movements (making the target financially attractive), the availability of technology not found domestically, and factors related to the domestic economic situation (e.g., domestic market stagnation). On the negative side are factors such as lack of information on prospective targets, the cost of replacing inefficient management overseas, government restrictions and regulations, as well as a "deep-rooted fear that [Japanese managers] might not be able to understand or control their foreign managers" (*Financial Times*, 12/4/88).

Conclusions

The literature has revealed that corporate acquisitions represent what would seem to be an effective way to enhance the ability of a firm to innovate by providing a means to access new technologies and knowledge. Acquisitions also represent an effective way for a firm to reposition itself with respect to its environment in conditions of rapid change through diversification and internationalisation. However, the extreme difficulty faced in

---

[73] The example of the long term problems encountered following the merger of Dai-Ichi Bank and Nippon-Kangyo Bank in 1971 illustrates this point. Over twenty-five years on, the two cultures have still not fully merged: "Even now if you have a former Dai-Ichi man in one position, his junior will always be a Kangyo man, and visa-versa. People always ask; 'Is he from 'D' or 'K', even now!'" (Interview with Kitazato, 1995).

[74] From discussion with Matsuoka, 1996. See Appendix II for details.

integrating the acquisitions may negate this effectiveness. For Japanese firms in particular, cultural factors result in the strategic use of international corporate acquisitions being fraught with difficulty. The literature has provided us with insights into strategic management in a changing environment driven by fast emerging technologies. However, it has also pointed to a certain incongruity. Acquisitions present such a series of complex managerial challenge for Japanese firms that it is hard to see why they would be viewed as a viable strategic response to environmental change. This review has pointed to the need for some form of alternative perspective for viewing the behaviour of the Japanese firms which will assist in highlighting understanding of the benefits that have accrued through the acquisition of ownership of the UK firms.

Chapter 4 Conceptual approach

Chapter overview

The previous chapter provided an outline of the various theoretical contexts in which the more readily apparent motives and benefits of the acquisitions are embedded. The three bodies of literature examined (strategic management, the management of innovation, and the management of acquisitions) provided differing standpoints from which elements of the research question could be addressed.

However, fuller analysis of the research question requires a conceptual framework which can provide a more integrated view of the issues under examination. What is needed is an approach which allows us to view the case studies not only in terms of the acquisition of technology and the Japanese firms' capacity to respond to immediate changes in the computer industry, but also to view them in terms of the acquisition of tacit knowledge and organisational skills that would allow the firms to respond to predicted wider reaching changes. As such, there is a need to view the behaviour of the firm in terms of its required resources, the way these resources are configured, and the means available to the firm by which these resources can be acquired, adapted and augmented. These resources encompass tangible and intangible strengths ranging from manufacturing capacity to command of a particular technology, from the knowledge of how to market products and services globally, to the ability of the organisation to adapt itself to fast changing conditions, and from the capacity to create knowledge internally to the capacity to internalise knowledge rapidly from external sources. The body of literature on competence and capability which has emerged from analysis of the firm in terms of its resources would seem to be able to provide components for the construction of such a framework.

This body of literature however lacks clarity and consistency in its use of terminology and unit of analysis. However, from this body of literature, a number of useful concepts can be distilled which provided us with a language for describing the behaviour of firms faced with a dynamic and uncertain environment. Using this language, we can define a number of key constructs. These can be combined with the rich contextual evidence of real-world cases to make it possible to develop a framework for enhancing our understanding of the role of acquisitions within a strategy

to ensure growth in the face of conditions of uncertainty driven by emerging technologies.

Introduction

Competence and capability analysis attempts to identify the intangible strengths within a firm and explores the ways in which these strengths can be leveraged and enhanced to provide maximum competitive advantage (Gregory, 1995). Such intangible strengths include the firm's tacit and explicit *knowledge assets*. While a lack of clarity is evident in the terminology used within the literature, at the simplest level, a competence can be viewed as "a bundle of skills and technologies rather than a single discrete skill or technology" (Hamel & Prahalad, 1994:223). A firm's capabilities are simply "the capacity of a firm to renew, augment and adapt its [..] competences over time" (Teece *et al.*, 1992:18).

These deceptively simple definitions given above have provided the basis for an alternative strategic management paradigm for identifying the sources of competitive advantage (Teece *et al.*, 1992). In contrast to *structural* competitive strategy paradigms (as discussed in Chapter 3), which focus on the positioning of products in markets, competitive forces, product market imperfections and entry deterrence, the basis of the *behavioural* competitive strategy paradigm presented by Teece *et al.* (1992) stems from the resource-based view of the firm[75] (Wernerfelt, 1984). Proponents of the resource-based view of the firm regard it as a more effective way of identifying sources of competitive advantage in conditions of rapid change (Stalk *et al.*, 1992). In relatively stable conditions, competition is based on a 'war of position', and consequently the structural, product positioning approach to strategy may well be adequate. In conditions of market fragmentation, rapidly converging technologies and accelerating product life cycles, competition is more accurately portrayed as a 'war of movement':-

> Successful competitors move quickly in and out of products, markets, and sometimes even entire

[75] The resource-based view of the firm as described by Wernerfelt (1984) has its origins in the work of Penrose (1959). Examination of a firm in terms of its resources leads to "different immediate insights than the traditional product perspective". Resources are taken to be "anything which could be thought of as a strength or weakness of a given firm. More formally, a firm's resources at a given time could be defined as those (tangible and intangible) assets which are tied semi-permanently to the firm. [..] Examples are brand names, in-house knowledge of technology, employment of

> businesses, [..]. In such an environment, the essence of strategy is *not* the structure of a company's products and markets, but the dynamics of its behaviour (Stalk *et al.*, 1992:62).

Building on the foundations provided by the resource-based view of the firm, a number of authors have sought to highlight certain features of competitive strategy in a dynamic environment. Prahalad & Hamel (1990) brought to the forefront of this strategic management debate the concept of a firm's *core competences*. These are 'unique' activities[76] that a firm can perform by clustering together certain firm specific assets, or *resources*. Such resources will be the tangible (e.g., specific technologies) as well as intangible (e.g., tacit knowledge of how to sell a product in a particular market). Stalk *et al.* (1992) have focused on the role of specific business processes, or *capabilities*, which allow the maximum effect to be leveraged from the firm's competences and which add to the firm's competitiveness. Teece *et al.* (1992) have added to this, highlighting the active nature of this behavioural approach to strategy with their discussion of *dynamic capabilities*. Building on Wernerfelt's (1984) resource-based view of the firm these authors represent what is arguably the 'core' of the new behavioural approach to competitive strategy based on competence and capability.

The competence and capability literature has been supplemented by authors writing from a number of differing standpoints. Nonaka (1991), and Nonaka & Takeuchi (1995) have focused on the process of *organisational knowledge creation*, and link these concepts with the work of Prahalad & Hamel (1990) by attempting to explain explicitly how such a knowledge creation process is used in Japanese companies to enhance the competences. Meyer & Utterback (1993) have discussed the ways in which *product families* impact on organisational capabilities. A common theme is picked up by Iansiti & Clark (1994) who stress the importance of *integration of internal and external knowledge* on the dynamic capabilities of the firm. Rosenbloom & Christensen (1994) add to the discussion the effect of *technological discontinuities*, or dramatic changes in technology, on

skilled personnel, trade contracts, machinery, efficient procedures, capital, etc." (Wernerfelt, 1984: 172).

[76] 'Unique' is not taken to mean that such activities are solely held by a single firm. To be 'unique' in this context the competences should not be ubiquitous across an industry.

organisational capabilities. In particular, they focus on the ways in which it may not be the lack of a technology that prevents them from competing in the face of a technological discontinuity, but rather the *inability of the organisation to react to changes*. The negative effects upon a firm's competitiveness of inflexibly focusing on the core capabilities and competences, or *core rigidities*, are explored by Leonard-Barton (1992). This work ties-in with consideration of path dependencies (Teece *et al.*, 1992), or the way in which firms present behaviour is heavily influenced by previous activities.

These authors, among others, have contributed significantly to the debate of how competences and capabilities may be used to add competitive advantage in a dynamic competitive environment, but have also added a certain impediment to the usefulness of the approach by providing a profusion not only of terminology, but also differing uses of the terminology. Also, as raised by Nonaka & Takeuchi (1995), there is a lack of comprehensive, all-encompassing theoretical framework which could facilitate a degree of integration of complementary concepts.

Despite these criticisms, the literature on competence and capability would seem to provide the richest source of components for building a working theoretical framework for the purposes of this research. In the following sections, the concepts developed by the leading authors in writing in the field of competence and capability are discussed, before moving on to an examination of the ways in which a firm may build-up competence and capability.

Competences and capabilities

Competences

As described earlier, competences are the groups of skills and technologies which are co-ordinated in a certain way so as to differentiate a firm from its competitors (Prahalad & Hamel, 1990). Examples of such are given as Sony's capacity to miniaturise and Philips' optical-media expertise. These competences represent the integration of learning across a broad range of individual skill sets and organisational units. They allow the firm to be viewed not as a diversified portfolio of businesses, but as a number of shared

competences. While Prahalad & Hamel (1990) stress the role of the co-ordination of skills and technologies, others have sought to add to the definition of competence the importance of other factors. For example, Teece *et al.* (1992) describe the competences that differentiate a firm from its competitors not only in terms of a set of differentiated skills, but also *complementary assets* and *organisational arrangements* which in combination allow a firm to co-ordinate a set of activities in a way that gives the firm competitive advantage in a particular market.

Core competences

Those competences that are critical to a firm's survival can be labelled as core (Teece *et al.*, 1992). Attempts to differentiate between 'core' and 'non-core' competences rest on a number of measures. At one level, a core competence should be one that stands at the centre of the firm's long-term competitive success (Hamel & Prahalad, 1994). Hamel & Prahalad (1994) provide three tests for identifying the competences that can be regarded as core:-

1. *Customer value* - the competence must make a disproportionate contribution to customer-perceived value. Core competences are the skills that enable a firm to deliver a customer benefit. In making an important contribution to customer perceived value, the core competence is not necessarily visible, or easily understood, by the customer.

2. *Competitor differentiation* - a core competence must be competitively distinctive. In this context, this does not mean that only one firm in an industry may be in possession of the competence. Rather, it implies that the holding of this competence is not ubiquitous across an entire industry, or that one firm's level of competence is substantially superior to others.

3. *Extendability* - a competence may not be considered core if there is no way of imagining an array of new products or services issuing from it. In practical terms, this means that in defining core competences, managers must work very hard to abstract away from the particular product configuration in which the competence is embedded,

and imagine how the competence might be applied in new product areas.

In practical usage, attempts to differentiate between a core and a non-core competence are somewhat problematic.

Capabilities

Competences and capabilities represent two differing but complementary dimensions of the behavioural paradigm for competitive strategy. While the usage of the terminology in the literature makes it hard to draw a clear dividing line between a competence and a capability, much of the literature points towards analysis in terms of capabilities emphasising the *business processes* along the entire value chain which allow a firm to differentiate itself from competitors by *reconfiguring resources*. Competence analysis focuses on the actual *configuration of resources* which can be applied to achieve some competitive advantage.

Stalk *et al.* (1992) go on to identify four principles on which capability-based competition stands:-

1. The building blocks of corporate strategy are not the products and markets but the business processes.
2. Competitive success depends on transforming a company's key process into strategic capabilities that consistently provide superior value to the customer.
3. Companies create these capabilities by making strategic investments in support infrastructure that links and transcends the traditional SBUs [strategic business units] and functions.
4. Because capabilities are necessarily cross-functional, the champion of a capabilities-based strategy is the CEO (Stalk *et al.*, 1992:62).

Comparing this with the points raised by Prahalad & Hamel (1990) it becomes clear that elements of the issues described above could be applied to a description of competence-based strategy. This point will be returned to in the critique given further on in this chapter.

Core capabilities

As with the earlier description of core competences, a firm's capabilities can also be considered 'core' if they differentiate the firm from its competitors strategically

(Leonard-Barton, 1992). Whereas the definition of capabilities given by Stalk *et al.* focused on differentiating between competences and capabilities, Leonard-Barton's approach is to provide a model of capabilities in four dimensions which encompass some of the key aspects of capabilities (See Exhibit 4.1).

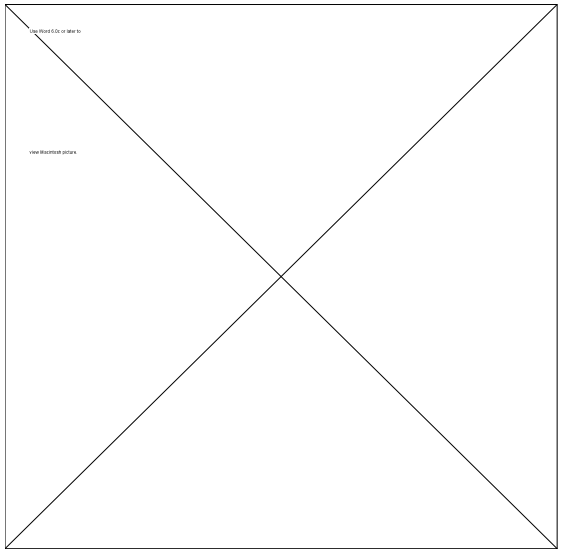


Exhibit 4.1 Four dimensions of core capabilities
Source: Leonard-Barton (1992)

These dimensions are:-

1. *Skills and knowledge* - these encompass both firm-specific techniques and scientific understanding.
2. *Technical systems* - the results of accumulating, codifying and structuring the tacit knowledge that rests with employees. This encompasses both information and procedures.
3. *Managerial systems* - the formal and informal ways of creating and controlling knowledge.
4. *Values and norms* - the value assigned to knowledge, the means of collecting knowledge and the controlling of knowledge.

However, as with competences, attempts to differentiate between core and non-core capabilities are extremely difficult.

Core rigidities

As mentioned in the introduction to this chapter, Leonard-Barton (1992) also discusses the downside of a resource-based strategy that focuses on the core capabilities:-

> [..] shortfalls in the process are often traceable to the gap between current environmental requirements and a corporation's core capabilities. Values, skills, managerial systems, and technical systems that served the company well in the past and may still be wholly appropriate for some projects or parts of projects, are experienced by others as core rigidities - inappropriate sets of knowledge. [..] these deeply embedded knowledge sets actively create problems. While core rigidities are more problematic for projects that are deliberately designed to create new, non-traditional capabilities, rigidities can effect all projects - even those that are reasonably congruent with current core capabilities (Leonard-Barton, 1992:118).

This ties-in with considerations of path dependencies (Teece *et al.*, 1992). In brief, this describes the situation where a firm's strategic options will naturally tend to focus in upon previously successful activities, even if these are inappropriate for the present conditions. Thus, as the environment changes, firms may find that the core competences and capabilities which provided their competitive advantage in the past are actually hindering their ability to adapt to the changing environment. This leads on to consideration of the dynamic nature of capabilities required to respond to changing conditions.

Dynamic capabilities

Teece *et al.* (1992) and Teece & Pisano (1994) contribute to the discussion of the role of capabilities in a behavioural competitive strategy by adding an emphasis to the dynamic nature of the management of the key business processes. By stressing the importance of considering the shifting nature of the competitive environment, they are able to define the *dynamic capabilities* of a firm as follows:-

> [Dynamic capabilities are] the capacity of a firm to renew, augment and adapt its core competences over time. Capabilities thus reflect the firm's latent competences (Teece *et al.*, 1992:18).

This view highlights the need to change internal and external organisational skills, resources and functional competences in response to a dynamic environment. Teece & Pisano (1994) advance the argument that the strategic dimensions of the firm can be viewed in terms of processes (the patterns of current practice and learning), positions (its current store of technology, customer base and network relationships) and paths (the

alternatives available to the firm).

The *processes* of importance to the discussion here can be identified as integration, learning, reconfiguration and transformation; the key *positions* as dependent upon technological assets, complementary assets, financial assets and location assets; and the *paths* as path dependencies and technological opportunities available to the firm.

Critique

Two major criticisms can be made of the literature on competence and capability as described above. Firstly, there is a need for a clear distinction between what is meant by a competence, and what is meant by a capability. The use of these terms varies from one author to another, and while some attempt to make clear definitions, others use these two terms interchangeably. While some authors talk rather confusingly of "a difficult-to-imitate competence/capability being a distinctive competence" (Teece *et al.*, 1992) and attempt to become ever-more specific by attempting to differentiate between "generic core competences" versus "distinctive core competences" (Meyer & Utterback, 1993) one factor becomes clear: often the authors are describing essentially identical concepts but with differing terminology. As pointed out by Leonard-Barton (1992) with regard to defining *capabilities*:-

> The concept is not new. Various authors have called them distinctive competences, core or organisational competencies, firm specific competence, resource deployments and invisible assets (*Ibid*., 111-112)[77]

Many authors have sought to clarify issues by introducing new terminology, but this seems to have in many cases added to the confusion rather than reduced it. However, by focusing on concepts embedded in the key literature, it becomes clear that the basic ideas of competences (the configuration of resources, including skills, knowledge and technologies) and capability (the way in which resources may be reconfigured to form new competences) are ones that as they stand, and without recourse to ever-more exact definitions, provide a useful tool for examining the behaviour of firms.

---

[77] Note: citations omitted.

A second criticism can be levelled at this body of literature. The use of a theoretical unit of analysis is inconsistent between authors. For example while authors such as Prahalad & Hamel (1990) and Leonard-Barton (1992) focus on the processes within the firm as the unit of interest, other authors (such as Stalk *et al.*, 1992) analyse competence and capability in terms of the changing business environment. Porter (1991) stresses the need to integrate consideration of both these *internal* and *external* factors:-

> Resources are not valuable in and of themselves, but because they allow firms to perform activities that create advantages in particular markets. Resources are only meaningful in the context of performing certain activities to achieve certain competitive advantages. The competitive value of resources can be enhanced and eliminated by changes in technology, competitor behaviour, or buyer needs which an inward focus will overlook (Porter, 1991:108).

What is required for the purposes of this research is an understanding of the process within the firm, which includes consideration of the evolving industrial environment. For the Japanese firms at the centre of this research, the immediate and anticipated changes in the competitive environment were dictating the internal processes required for firms to survive. For example, the highly open, systemic and rapidly changing nature of the 'new' computer industry was dictating that firms attempting to operate within this industry needed themselves to be open (able to work with external organisations), systemic (to have an intimate knowledge of how their products and services fitted with and relied upon those of other firms), and able to respond rapidly to change in the competitive environment.

Despite the criticisms, the resource-based view of the firm provides us with a language for discussing the issues of the how the changing industrial environment was influencing the internal management processes required of the firms at the centre of this research in order to remain competitive.

In the following section, the discussion turns to consideration of the ways in which firms are able to enhance both their competences and capabilities.

Building up competences and capabilities

As discussed earlier, competence and capability analysis stems from an understanding of

a firm in terms of its resources[78] - competences are the bundles of resources; capabilities are the ways in which the firm can reconfigure these resources over time. Consequently, a discussion as to how competences and capabilities may be enhanced needs to be rooted in an understanding of the ways in which a firm's resources may be exploited. Hamel & Prahalad's (1993) description of resource *stretch* and resource *leverage* provide a useful five-point framework on which to base such a discussion. The five points of their framework are:

1. resource concentration,
2. resource accumulation,
3. resource complementing,
4. resource conserving, and
5. resource recovery.

Each of these five points represents a process for manipulating resources (a capability), and the output from each process represents an augmented, renewed or adapted grouping of resources (a competence).

Concentration

Hamel & Prahalad (1993) discuss the requirements for effective concentration of resources in terms of *convergence* and *focus*. The first of these two terms refers to the need for the efforts of individuals, functions and businesses to be convergent upon a common focal point over time. Such a common focal point requires a high degree of commitment to the company's growth trajectory to avoid the squandering of resources on competing projects. Given a dynamic environment, such as that of the IT industry, convergence is not always easily achieved.

[78] Resources, as defined earlier, encompass more than just tangible assets. An important dimension to a firm's resources is that of knowledge. A firm can be viewed as a "repository of knowledge" (Fransman, 1994:715), and this body of knowledge is added to through the experiences of the employees. The relative efficiency of the various processes by which knowledge is accumulated, adapted and applied is one way in which a firm may be differentiated from its competitors. The term 'resources' in the discussion below is taken to include both the tangible and intangible.

Focus requires attention to be given to key operating goals *at any one time* (as distinct from convergence, which refers to the allocation of resources over time). The dilution of resources across a wide range of goals and projects is unlikely to lead to satisfactory performance of the firm in the medium to long term.

Accumulation

Resources, and in particular knowledge can be accumulated by a number of means, including *extraction, borrowing* and *creation*.

Extraction refers to the drawing-out of knowledge from the cumulative experiences of employees. The processes of dealing with customers, analysing competitors and solving technical problems provides a valuable source of knowledge which a firm can utilise to add to its competitiveness. For extraction to be effective, an appropriate corporate environment needs to be cultivated where employees can become skilled at problem identification and solving, and where all employees feel a responsibility for the firm's competitiveness.

The term *borrowing* encompasses a number of means by which a firm may gain resources from outside its boundaries. The options available form a spectrum ranging from the reverse engineering of competitor's products and industrial espionage, though to the taking-over of ownership of a firm possessing a resource lacking in the parent organisation. Intermediate strategic options along that spectrum include joint venture partnerships, licensing agreements, technology purchasing, selective hiring, the use of consultants and the scanning of trade and academic journals. Some of these options may only be appropriate for the acquisition of more tangible resources and explicit, relatively easy to transfer knowledge of a particular technology[79].

The effective acquisition of the more intangible resources such as the tacit knowledge held within another firm requires a high degree of interaction between the two organisations. It also calls for an understanding of the processes of organisational learning

[79] The acquisition of technology was discussed in more detail in Chapter 2, Part II.

(Argyris & Schön, 1984) and knowledge conversion (i.e., between tacit and explicit knowledge) (Nonaka & Takeuchi, 1995). Joint venture partnerships (Hamel *et al.*, 1989) and corporate acquisitions (Haspeslagh & Jemison, 1991) form two major ways in which a firm can attempt the transfer of such intangible resources[80].

Consideration of the relative merits of accumulation through joint venture partnerships and acquisitions adds to the discussion of the use of these strategic options given in Chapter 3. Japanese firms have shown a preference for using joint ventures for acquiring distinctive competences (Hamel & Prahalad, 1993). The case of NEC is cited as an example of the use of alliances by Japanese firms:-

> NEC relied upon hundreds of alliances, licensing deals and joint ventures to bolster its product development efforts and to gain access to foreign markets. Alliances with Intel, General Electric, Varian and Honeywell, to name a few, multiplied NEC's internal resources. Indeed, NEC managers have been forthright in admitting that without the capacity to learn from their partners, their progress towards the goal of computers and communication[81] would have been much slower (Hamel & Prahalad, 1993:80).

However, such strategic alliances require careful management if the desired goals are to be achieved. There is the risk, when entering into such partnerships, of the inadvertent surrendering of resources to an alliance partner (Reich & Mankin, 1986). In addition, reliance upon an alliance partner can cause extreme problems when there is a risk of change of ownership of that partner, e.g., a hostile take-over bid. In such a situation, it may become necessary for one partner to acquire a large capital stake in the other as a defensive move to ensure continuing access and transfer of resources.

The literature relating to intangible resources has tended to focus on how knowledge is *acquired* and *accumulated* (Argyris & Schön, 1984; Senge, 1990[82]), but less attention has been given to the functioning of the knowledge *creation* process. This issue has recently

---

[80] At a different level, the head-hunting of staff from competitors can provide one means of transferring tacit knowledge between firms. This option is particularly prevalent in the IT industry, and the relative frequency and ease with which it occurs (the "hypermobility" of labour) is discussed by Florida & Kenney, (1990).

[81] The strategy of integrating skills in telecommunication, semiconductor, and computer related technologies to exploit the convergence of communication and computers - 'C&C'.

[82] Senge (1990) introduces the concept of 'learning disabilities' within organisations which may impede the ability of a firm to acquire new knowledge.

been addressed in some depth by Nonaka & Takeuchi (1995).

> The organisation which wishes to cope dynamically with the changing environment needs to be one that creates information and knowledge, not merely process them efficiently. [..] Understanding how organisations create new products, new methods and new organisational forms is important. A more fundamental need is to understand how organisations create new knowledge that makes such creations possible (Nonaka & Takeuchi, 1995:50).

Nonaka & Takeuchi go on to highlight the way in which knowledge is created though the interaction between tacit and explicit knowledge, and how these various conversion processes lead to 'new' knowledge (See Exhibit 4.2).

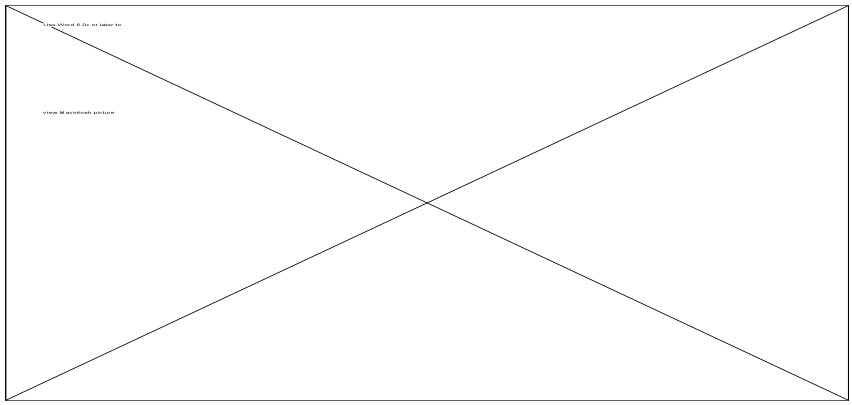


Exhibit 4.2 Four modes of knowledge conversion
Source: Nonaka & Takeuchi (1995)

Complementing

The ability to blend resources to create synergistic benefit is an extremely powerful form of leverage. Kodama (1991;1992) cites the success of Japanese firms in 'opto-electronics' (the combining of skills in optics and electronics) and 'mechatronics' (the combining of skills in mechanics and electronics) as examples of this form of resource leverage, which he labels *fusion*. Kodama (1992) provides three principles for technology fusion. Firstly, for fusion to be successful, the market must drive development, not visa versa. Secondly, an active and efficient intelligence network is required to maintain links with developments both inside and outside the industry. Employees must be "active receivers" of information. Thirdly, it is vital for firms to actively engage in external R&D consortia in a manner which is both reciprocal and substantial. It can be seen that this form of leverage ties-in closely with the need for a firm to be an efficient 'borrower' of

knowledge from external sources.

For the blending and fusing of resources to be successful, Hamel & Prahalad (1993) identify an alternative three factors of importance. Firstly, there must be the ability to integrate new technologies, which itself relies upon the availability of technology generalists, 'systems thinkers' (Senge, 1990; Senge & Sterman, 1992) and the ability to optimise technological trade-offs. Secondly, there is the requirement to integrate the diverse functional skills such as R&D, production, marketing and sales. Thirdly, there is a requirement for a high degree of ingenuity to think-up potential new product opportunities, based on the input from the various functional areas within the firm, and from outside.

A second dimension to the complementing of resources is that of *balance*. This refers to the ability of a firm to maintain a sound footing in the key three areas: strong product development skills; the capacity to produce goods; and the ability to distribute, market and service its products. An adequate deployment of resources in each of these dimensions must be maintained to provide the required balance.

Conserving

Conserving encompasses all efforts made by a firm to re-cycle its resources and to prevent competitors gaining access to them. Strategies of use here include *co-opting*, or the recruiting of potential competitors as an ally against a third party. The relationship between various Japanese, European and US computer firms in the 'war' against IBM can be seen as a good example of this form of resource leverage.

An additional factor is the *defending* of resources. Defence includes the use of acquiring a capital stake in a partner to prevent competitors from gaining access to the distinct resources and competences that the partner may possess.

Also included in this category of resource leverage options is the concept of *shielding*, or the avoidance of full frontal attack on a stronger competitor by targeting resources on a weak, unanticipated target area.

Recovery

The final dimension of resource leverage is that relating to the speed at which resources are recovered from the market. A firm than is able quickly to recover resources through revenue from the market will add to its competitiveness. One way of achieving this is through a shortening of the product development process. Firms operating in the high technology industries already have a strong motivation to reduce product development times, as the time between new technologies being developed, these technologies being converted into products, and these products becoming technologically and commercially obsolete, is reducing rapidly (von Braun, 1990).

A note on capability enhancement

While it is relatively easy to see how competences may be enhanced (i.e., through borrowing, concentration, recovery, etc.) it is not quite so obvious how a firm may enhance its capabilities, i.e., those processes or routines by which the competences are renewed, augmented and adapted over time. In the same way that a firm may lack a specific resource which is required for it to build a distinctive competence, it may also lack capability - the skill of a particular organisational or managerial process which would allow the firm to enhance or acquire that specific resource. Such capabilities include skill at resource accumulation, concentration, complementing, conserving and recovery.

An example of such an organisational process might be the ability to manage a corporate acquisition or a joint venture partnership. Such a capability may not easily be acquired (Teece & Pisano, 1994). It may be that such a capability can only be internalised by experience. Thus an organisation seeking to become skilful in the use of strategic alliances as a means to acquire resources and competences can only do so by actually forming such an alliance and effectively 'learning by doing'. This can be seen to tie-in with the concepts of single and double loop learning (Argyris & Schön, 1984) whereby organisations seek not only to learn a specific skill but seek ways of enhancing their ability to learn new skills, i.e., 'leaning how to learn'. It can be seen how such concepts

can be included in examination of the behaviour of the Japanese firms at the centre of this research. These firms may have been seeking not only the acquisition of a particular resource, but also by acquiring, they were learning a 'new' process for internalising resources in the future.

Components of an analytical framework

The discussion in this chapter has provided us with a number of concepts for viewing the behaviour of firms in terms of the manipulation of resources. Viewing the firm in terms of its competences and capabilities provides us with a lens for examining behaviour in the face of rapid change and uncertainty driven by emerging technologies.

For firms in such a position, the acquisition of technologies is not necessarily the most appropriate strategy, as firms do not know which technologies to acquire. Until standard architecture and applications have emerged, building up competence based around an inappropriate technology can be disastrous. What a firm needs is the ability to develop a suitable organisational structure and to have the appropriate capabilities to allow the firm to respond to changes as and when they occur. Consideration in terms of competence and capability provides us with the ability to gain a more integrated view of the behaviour of firms in conditions of such uncertainty.

Following on from the distillation of central concepts of resource, competences, capabilities, and the means by which these may be enhanced, it is now possible to construct a rudimentary analytical framework.

A primary component of this framework is a consideration of the way in which a firm will respond to changes in the environment (e.g., competitors gaining market share), or the emergence of new business opportunities (e.g., evolving from a new technology), or simply an 'unknown quantity'. In such a situation, a firm will seek to develop a strategy to allow it to respond to these changes or opportunities. In seeking to develop a strategy, the firm will face certain constraining factors which will limit its choice of action. These limiting factors may be regarded as dependent upon *what the firm has got* or can access, and *what the firm can do*. Using the language of the resource-based perspective,

simplified for our purposes, these involve consideration of:-

1. *Core resources* - The store of tangible and intangible *firm specific* resources that the firm has internalised. Such resources include in-house knowledge of technology, skilled personnel, brand names and contracts.
2. *Complementary resources* - The additional resources which may be required to be combined with certain core resources to form a competence. Such resources may include sales, distribution, complementary technologies or competitive manufacturing facilities.
3. *Competences* - The ways in which resources are bundled together to form specific and distinctive skills areas.
4. *Capabilities* - The routines or processes which allow the firm to reconfigure its resources. These include resource concentration, accumulation, complementing, conserving and recovery.
5. *Competitive environment* - The influence of competitive pressures in the firm's external environment will influence how rapidly and in what way the firm must reconfigure resources.
6. *Path dependencies* - A firm's previous investments and activities will, to a certain extent, restrict its behaviour. Attempts to reconfigure and adapt resources will naturally tend to close in on previous successful activities.

It may be that these factors do not constrain the choice of effective response, and that the firm's existing resources, competences and capabilities will be sufficient to allow an effective response to be developed. However, it is likely that some form of adaptation will be necessary to allow an appropriate strategy to be developed and implemented. Such actions can be categorised into the following groupings:-

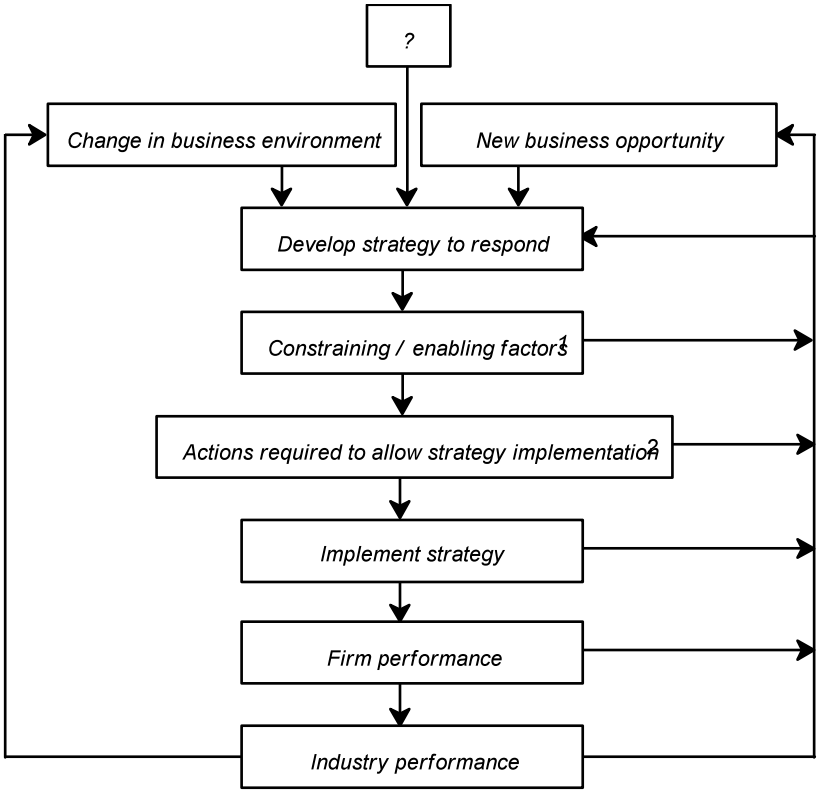
1. *Stretching and leveraging resources* - through the activities of concentrating, accumulating, complementing, conserving and recovering. These activities will allow the firm to enhance not only the essential 'core' resources, but also the additional

requirements, e.g., complementary assets.

2. *Reconfiguring these resources* - to form new or enhanced competences. These competences will then provide the means to develop a response to changes in the environment, or to take advantage of new business opportunities.
3. *Acquiring knowledge of new processes or routines* - These new processes or routines will enable new ways of reconfiguring resources to form new competences.

The selection of an appropriate strategy and the efficiency of its implementation will have a direct influence on the firm's performance. This strategy must be suitably flexible to respond to changes in the environment during its implementation. The success of the firm will have an impact on the firm's external environment, and this will feed-back in the form of new opportunities and challenges to which the company must respond. By integrating these steps of reasoning, it is possible to construct a simple framework for analysis. A visual representation of this framework is presented in Exhibit 4.3.

The next stage in this research is to assess the evidence required in combination with this framework to enhance our understanding to the use of corporate acquisitions by Japanese firms, faced with a dynamic and uncertain environment driven by fast emerging technologies.



1 Factors include:

- Firm specific resources.
- Competences.
- Capabilities.
- Complementary resources.
- Competitive environment.
- Path dependencies.

2 Actions include:

- Stretching / leveraging resources.
- Reconfiguring resources to form new competencies.
- Acquiring / learning new ways to reconfigure resources.

Exhibit 4.3 Rudimentary conceptual framework
Source: Derived from Teece *et al.* (1992)

Chapter 5 Research methodology

Chapter overview

This chapter has two aims. The first is to assess the evidence required to investigate the research questions of the thesis in the light of the conceptual approach so far developed. The second is to consider the methods appropriate to obtaining and interpreting the relevant evidence, which includes pragmatic considerations of time and cost.

The chapter is structured around the following format. Firstly, we explore briefly the various sources of data that could potentially be used to assist in the building of a theoretical framework to enhance our understanding of the use of acquisitions by Japanese firms. This exploration points to the use of case studies for obtaining qualitative data to support the development of the theoretical framework. Following a discussion of the strengths and weaknesses of such an approach, the process of selecting an appropriate case study format is then described. The final section of the chapter outlines the data acquisition protocol used for obtaining the relevant qualitative data.

Methodology selection

The selection of an appropriate methodology in social science is embedded in an understanding of the relation between data and theory. The two opposing paradigms constructed around this relationship can be summarised as those of positivism and phenomenology (Easterby-Smith *et al.*, 1991). The nature of the research and the allying of the research design with a particular paradigm presents a series of choices for the research, as can be seen in Exhibit 5.1.

Though clearly taking a somewhat positivist approach, Yin (1994) provides a summary of conditions for selecting an appropriate research strategy in the social sciences. The three conditions are dependent upon; (1) the type of research question posed, (2) the extent of control an investigator has over actual behavioural events, and (3) the degree of focus on contemporary as opposed to historical events (See Exhibit 5.2).

	Positivist paradigm	**Phenomenological paradigm**
Basic beliefs	• The world is external and objective.	• The world is socially constructed and

	• Observer is independent. • Science is value free.	subjective. • Observer is part of what is observed. • Science is driven by human interest.
Researcher should	• Focus on facts. • Look for causality and fundamental laws. • Reduce phenomena to simplest elements. • Formulate hypothesis and then test them.	• Focus on meanings. • Try to understand what is happening. • Look at the totality of each situation. • Develop ideas through induction from data.
Preferred methods include	• Operationalising concepts so that they can be measured. • Taking large samples.	• Using multiple methods to establish different views of phenomena. • Small samples investigated in depth or over time.

Exhibit 5.1 Key features of the positivist and phenomenological paradigms
Source: Easterby-Smith *et al.*, 1991

Research strategy	**Form of research questions**	**Requires control over behavioural events?**	**Focuses on contemporary events**
Experiment	how, why?	Yes	Yes
Survey	who, what, where, how many, how much?	No	Yes
Archival analysis	who, what, where, how many, how much?	No	Yes/no
History	how, why?	No	No
Case study	how, why?	No	Yes

Exhibit 5.2 Relevant strategies for research
Source: Adapted from Yin (1994)

From an examination of the main question posed in the opening chapter of this dissertation (*How have Japanese firms been able to benefit from the acquisition of UK IT firms to enhance their ability to compete in the complex and dynamic environment of the IT industry?*), the conditions provided by Yin pointed to the use of some form of historical case study[83] as the most appropriate form of data collection.

[83] The distinction between a historical analysis and a case study, as described by Yin (1994), is that for a pure historical study, the researcher is dealing with the 'dead' past, i.e., no relevant persons are alive to report on events, and that the main source of information is primary documentation, secondary documentation and other artefacts.

However, the use of case studies in organisational research carries a number of drawbacks. The issue of generalisation is often perceived as one of the major problems emerging from the use of case studies in social science research (Bryman, 1989). This stems from the inappropriate application of statistical notions which treat each case as a sample of one, and consequently attempts to discount any inferences drawn from such a single sample. A number of authors (including Yin, 1994; Bryman, 1989) have argued that such reasoning should not be applied to case study research:-

> [..] case studies should be evaluated in terms of the adequacy of the theoretical inferences that can be generated. The aim is not to infer the findings from a sample to a population, but to engender patterns and linkages of theoretical importance (Bryman, 1989:173).

This view is echoed by Eisenhardt (1989), who describes the role of case studies in building theory. Eisenhardt contends that, while there are weaknesses to this approach, such as the intensive use of empirical evidence yielding theory which is overly complex and the resultant theory being "narrow and idiosyncratic", there are a number of strengths in using case studies for theory building. These include the increased likelihood of generating novel theory, the measurability of emergent theories, and the empirical validity of resultant theories. These factors, coupled with the nature of this project and the conceptual approach so far developed would seem to point to the appropriateness of using a case study methodology. This is supported in particular by Eisenhardt's description of the applicability of the use of case studies for theory building:-

> [..] the theory building process relies on past literature and empirical observation or experience as well as on the insight of the theorist to build incrementally more powerful theories. However, there are times when little is known about a phenomenon, current perspectives seem inadequate because they have little empirical substantiation, or they conflict with each other or common sense. Or, sometimes, serendipitous findings in a theory testing study suggest the need for a new perspective. In these situations, theory building from case study research is particularity appropriate because theory building does not rely upon previous literature or prior empirical evidence. Also, the conflict inherent in the process is likely to generate the kind of novel theory which is desirable when extant theory seems inadequate (Eisenhardt, 1988:548).

The line of reasoning taken so far in this thesis has pointed to a situation where emerging issues "conflict with each other or common sense", i.e., the use of acquisitions by Japanese firms can be viewed as an effective means to internalise technology, but they

also present complex managerial challenges for Japanese firms. The perspectives provided by the literature have been inadequate, and pointed to the need for an approach which provides an alternative means for viewing the use of acquisitions. It would seem that a theory built from material drawn from examination of cases and combined with the analytical constructs so far developed would be able to provide such a perspective.

Design of the case study

The design of a case study can fall into one of four categories (Yin, 1994) (See Exhibit 5.3). The variables which define the categories are the use of single, or multiple cases, and the use of single, or multiple units of analysis.

	Single-case designs	***Multiple-case designs***
Single unit of analysis	*Type 1*	*Type 2*
Multiple units of analysis	*Type 3*	*Type 4*

Exhibit 5.3 Types of case studies
Source: Yin (1994)

Multiple versus single case studies

Multiple case studies would seem to have certain advantages over singles case studies. For example, multiple cases allow for the comparison, or triangulation of results and arguably provide a more 'robust' set of results for the research than single case studies (Herriott & Firestone, 1983). However, such an argument could be seen as implying the inappropriate application of statistical notions (Bryman, 1989). There are situations where single cases will be more suitable[84], though adding further cases can have

[84] The situations whereby a single case study will be the most appropriate can be grouped into three areas. Firstly, the research questions may represents a critical case in testing a well formulated theory. Secondly, when the research represents an extreme or unique case. Thirdly, the research may represent a revelatory case - the observation of a

advantages:-

> The reasons for including a second case (or more) are usually twofold; the generalizability of the research may be enhanced, and comparisons allow the special features of the cases to be identified more readily (Bryman, 1989:171).

The logic underlying the use of multiple case studies is based partly on rationale of *replication*, rather than *sampling* logic. Thus, it is not a matter of choosing a sample from a population which will provide the most representative view of the population as a whole, as would be the case when using a survey. Instead, replication provides a rationale for selecting more than one case based upon the idea that the theory under examination should be tested in more than one comparable context to see whether it 'fits' (Bryman, 1989; Yin 1994). This is discussed further in the section on Validity.

The choice of an 'adequate' number of cases is bounded at the upper level by practical considerations relating to the research project resources, as well as issues relating to the problems of managing a large quantity of rich and complex data (Miles & Huberman, 1984). At the lower end of the scale, the restrictions and options have already been discussed in relation to the choice of single or multiple cases.

Single or multiple units of analysis

In selecting between a single unit, or multiple units of analysis approach within each case, there are a number of issues to be considered. A single unit approach is useful for providing a global view of the issues at stake within an organisation. By selecting one unit of analysis, the research will naturally focus upon the perceived target of the research. While this has the advantage of simplicity and clarity, if the nature of the research target shifts during the project, the unit of analysis initially selected may be inappropriate. It may then becomes necessary to either restructure the research questions, or to select a different unit of analysis. A multiple unit of analysis approach has the advantage of allowing investigation to take place at a number of different levels, and consequently can provide a broader picture of the issues under examination. However,

---

phenomenon previously inaccessible to scientific research.

this approach also has its disadvantages. For example, examination of a sub-unit of analysis may shift the focus of attention away from the original, broader research issues (Yin, 1994).

Validity, reliability and generalisability in case study research

Whatever method is used to acquire data for research in social science, there is a need to ensure that the method will stand up to external scrutiny. Much of the language used for this purpose has been developed from quantitative research, and the usage in qualitative research may imply an acceptance of "one absolute positivist reality" (Easterby-Smith *et al.*, 1991). However, concepts such as validity, reliability and generalisability, though developed from quantitative research practices and often perceived as representing the application of the positivist viewpoint, can also be applied for use in interpretativist research (See Exhibit 5.4).

	Positivist viewpoint	**Phenomenological viewpoint**
Validity	Does the instrument measure what it is supposed to measure?	Has the researcher gained full access to the knowledge and meanings of informants?
Reliability	Will the measure yield the same results on different occasions (Assuming no real change in what is to be measured)?	Will similar observations be made by different researchers on different occasions?
Generalisability	What is the probability that patterns observed in a sample will also be present in the wider population from which the sample is drawn?	How likely is it that ideas and theories generated in one setting will also apply in other settings?

Exhibit 5.4 Questions of reliability, validity and generalisability
Source: Easterby-Smith *et al.*, 1991.

Though there is a risk of reverting to the inappropriate application of qualitative, statistical notions (as discussed earlier, from Bryman (1989)) for interpretativist research, these terms do provide us with a "useful discipline" for ensuring the consistency and coherence of the material acquired (Easterby-Smith *et al.*, 1991). As such, these concepts form an essential component of the design case study protocol.

The generalised format of a multiple case study design is given in Exhibit 5.5.

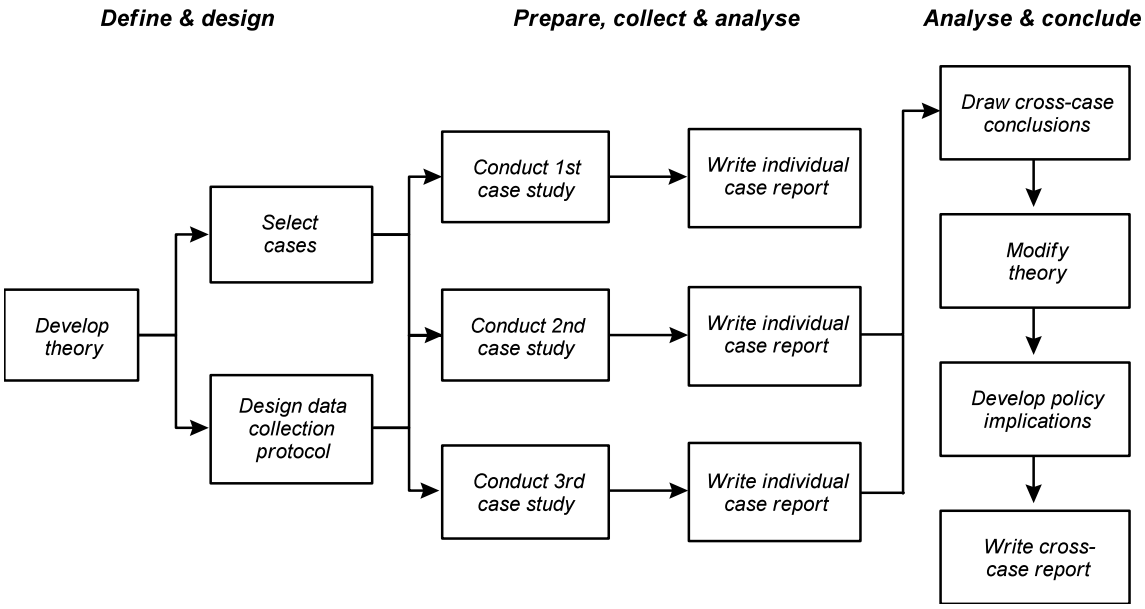


Exhibit 5.5 Multiple case study methodology
Source: Yin (1994)

Selection of appropriate case study design

Having considered the various dimensions of the design of generic case studies, the next stage is to describe the actual design of the case studies used in this research.

As described by Bryman (1989), it is often implied that case study research in theory building points to the use of a single case. However, considerations of generalisability and validity point to the advantages of using more than one case (Easterby-Smith *et al.*, 1989; Yin, 1994). This is also true of the number of units of analysis used within each case. Balancing considerations of practicality with reliability, it was decided for this research to select three acquisitions to be used as cases for detailed examination in this research. The three acquisitions were selected on the basis of the size of the acquired UK firms to allow consideration of a 'small', 'medium' and 'large' acquisition[85]. Within each case, there were two units of analysis, corresponding to the IT division of the Japanese firm, and the acquired UK firm as a whole. Providing two units of analysis allowed comparisons within each case, as well as comparison between cases.

[85] These three labels were applied to the sales of the acquired UK firms prior to acquisition as follows: Small < £10m, £10m >medium<£100m, large > £100m.

Having selected the number of cases and the units of analysis within each case, the next stage was to identify the sources of material required for developing an understanding of the case study acquisitions.

Sources of data

The potential sources of data which can be used within a case study methodology are shown in Exhibit 5.6.

Source of data	**Examples include:**
Documentation	Letters, minutes of meetings, reports, newspaper articles.
Archival records	Service records, survey data, organisational records.
Interviews	Open ended interviews, focused interviews, structured interviews.
Direct observations	Site observations (including meetings, factory work).
Participant observation	Researcher assumes role within case study situation.
Physical artefacts	Physical devices, tools or instruments which are collected or observed.

Exhibit 5.6 Types of data for case studies
Source: Adapted from Yin (1994)

The sources of data used for this research project fit into one of four categories (See Exhibit 5.7). *Primary* data relates to data specifically acquired for the present programme of research, whereas *secondary* data refers to data collected for another purpose and kept archived in some form (Stewart & Kammins, 1984). *Internal* refers to data emerging from the main unit of analysis - the Japanese parent company. *External* data describes data sources outside the Japanese parent firm - competitors, financiers, government sources, etc. Lying between internal and external data is the 'grey' area within which data from the acquired UK firms rests. As this research attempts to explain events that took place over a period of time corresponding to the acquisition process and continuing up until the time of writing, the UK firms effectively move from being external sources to internal. For the sake of simplicity, these firms will be positioned in the grey area between internal and external. In the following sections, the sources for the case study material are described briefly. A full listing of all sources of data is given in Appendix II. Details of the actual data acquisition protocol used to acquire the data from the case study companies is given

further on.

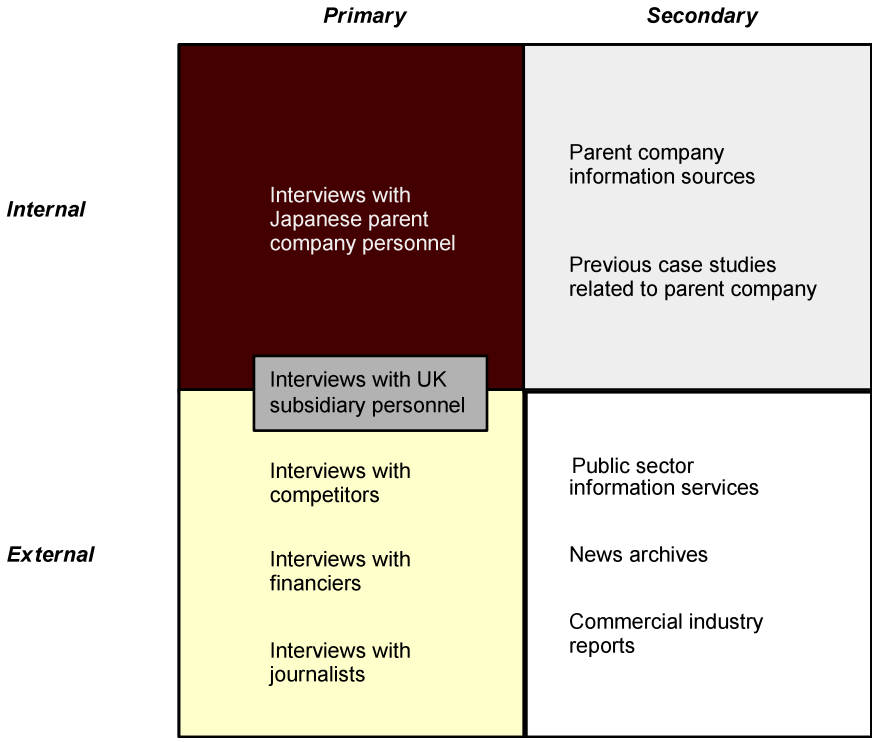


Exhibit 5.7 Sources of data for the case studies

Primary internal sources

This data was acquired through the use of semi-structured interviews with senior- and middle-management within the Japanese parent company and within the UK subsidiary. Details of the format of these interviews is given in Appendix II.

Primary external sources

Primary external data relating to the case study companies was acquired though interviews with management within competing firms (including personnel from other case study companies), within financial organisations having interests connected with Japanese firms operating in the UK, and with journalists and researchers whose areas of interest overlapped with the focus of this research.

Secondary internal sources

These sources of data encompass all information published by the parent companies themselves. They include annual reports, publicity material, Web pages and other material published by, or in close connection with the parent company. This last category

includes books written by company insiders, and previous case studies carried out with a high level of co-operation from the firms themselves.

Secondary external sources

Data from these sources was acquired in the form of industry reports from Japanese and government agencies (e.g., MITI), the results of searches of news archive services (e.g., *Reuter Business Briefing*, *FT Profile*) and industry case studies (e.g., *DataQuest, Investor's Business Daily*).

Selection of case study firms

Having selected an appropriate methodology, it was then necessary to identify suitable firms for use as case studies. Suitable firms were categorised as those which fitted five criteria, as summarised below:-

1. The parent organisation must be based in Japan.
2. The parent organisation must have taken a majority ownership stake in a UK IT firm.
3. The acquisition of ownership must have taken place between 1988 and 1992[86].
4. The firms must agree to give adequate access to the researcher.
5. There must be a sufficient quantity of external data available on the companies.

In order to select suitable firms, a short-list was drawn up from Japanese firms whose acquisition of UK firms had been documented in publications stored in the *FT Profile* news archive. From this list, a number of potential firms emerged. After contact with the Japanese parent firm and the UK subsidiary, and consideration of the other factors listed above, three cases emerged as being most suitable. The outline details of these three acquisitions is given below in Exhibit 5.8.

	Case A	***Case B***	***Case C***

[86] This time-frame was included to ensure reasonable consistency, and to include consideration of factors relating to the integration of the European Union in 1992.

Japanese parent firm	**Fujitsu**	**Mitsubishi Electric**	**Kao Corporation**
Business areas	Communication systems, computer systems, electronic devices.	IT systems, heavy electrical machinery, consumer electronics.	Detergents, cosmetics, fatty chemicals, edible oils, IT products.
Approximate sales at time of acquisition / £m	12,000	15,000	2,700
Acquired UK firm	**ICL**	**Apricot Computers Ltd (hardware division)**	**Protoscan Software Services**
Business areas	Computer systems, computer services.	Computer systems.	Software support services.
Approximate sales at time of acquisition / £m	1,600	81	3.4*

Exhibit 5.8 Case study firms
Source: Company reports and *Costello (1992) Note: £1: ¥200

Data collection protocol

A schematic outline of the data collection protocol is given in Exhibit 5.9. The two stages of the process are outlined below.

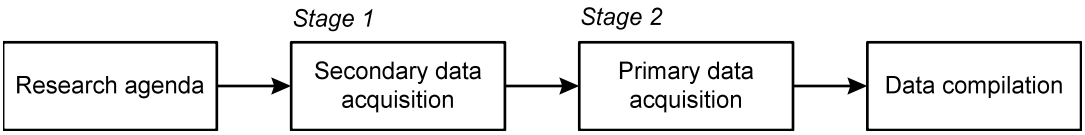


Exhibit 5.9 Data collection protocol

Stage 1

In the first stage, contextual evidence relating to the case study acquisitions was acquired from examination of secondary data sources. This stage began with a search of news items drawn from two commercial archives[87] containing reference to both the Japanese parent and the target UK company. Content analysis of the returned news stories was then undertaken to select those which either; (a) provided useful background information on the case study companies and the industry environment, or (b) provided material relating

[87] *FT Profile* and *Reuter Business Briefing*. Details of publications covered by these archives is given in Appendix II

explicitly to the acquisitions. Following this, the case study companies were approached directly, and via the Internet to obtain as much secondary material as possible relating to company performance, financial figures, organisational structure, product ranges and strategies. A bibliographic search was also carried out to determine what had been written on the case study firms by academics, in the form of working papers, journal articles, dissertations and published books.

Reports published by commercial industry intelligence firms such as *DataQuest* were accessed to gain industry background information and an understanding of trends. Various Japanese government departments and government sponsored agencies, such the MITI, JETRO and EIAJ were also approached for additional data on the IT industry in general and specific material relating to the case study firms.

Stage 2

In Stage 2, the focus moved to the collection of rich contextual evidence from primary data sources. Firstly, external sources such as journalists, corporate financiers and researchers with interests in the same field as this project were used. Interviews were arranged with these sources, and the format of data collection protocol used was one of face-to-face, semi-structured/open ended interview[88].

Secondly, certain key personnel within the case study firms were targeted, and interviews arranged in the UK and Japan. The picture of events developed in Stage 1 of the data acquisition process, and the additions made to this picture by the external interviews added to the richness of information obtained during these internal interviews and acted as a means of checking the validity of material acquired.

Validity, reliability and generalisability

The purpose of using case studies for this research was to provide rich contextual evidence which would be combined with theoretical constructs drawn from the literature on the resource-based perspective to build a framework for enhancing our understanding

[88] Details of the format of these interviews is given in Appendix II.

of the behaviour of firms in conditions of uncertainty driven by fast emerging technologies. As such, the validity, reliability and generalisability of the methodology needed to be considered at two levels. Firstly, there was a need to ensure that the material acquired from the 'critical cases' (i.e., those used to build theory) was authentic and appropriate, as well as consistent and coherent across cases so as to ensure the validity and reliability of the research. Secondly, there was a need to ensure the robustness of the framework developed in order to ensure, as far as was possible, the overall generalisability of the research (See earlier Exhibit 5.5).

For addressing the first level issues, the protocol developed ensured that the material acquired was authentic by relying on both primary and secondary, as well as internal and external sources, and was appropriate by focusing data acquisition efforts on a series of key issues during the interviews and content analysis. The use of a semi-structured approach to both the interviews and content analysis ensured the consistency and coherence of evidence across cases (See Appendix II for details of approach used).

For the issue of generalisability, i.e., the likelihood that the theories built by this research can be applied in other settings, the application of "replication logic" (as described by Bryman (1989) and Yin (1994)) through the use of multiple cases for the provision of evidence provides a means for ensuring this. However, it is worth reiterating that this research focuses on the *building* of theory from the combining of a conceptual approach drawn from literature with the evidence from case studies, not the *testing* of extant theory. As such, the application of 'tests' to ensure the generalisability of the framework as it is being developed would seem again to represent the inappropriate application of statistical notions, as discussed at the start of this chapter[89].

Compilation of data

Having described the selection of an appropriate methodology for acquiring the rich qualitative material to support the building of a theory to investigate the research

[89] Eisenhardt (1989) argues that the building of theory that can be extended beyond specific phenomena requires a combination of both theory building and theory testing empirical studies.

questions, the next stage was to present the material in some structured format prior to analysis. Each of the case studies is presented as a report built around the following structure:-

- Background to bidder and target
- Environmental conditions that led to the firms coming together.
- The process of acquisition
- Integration issues
- Longer term developments

In the following chapters, the three case studies are presented prior to combining with the constructs of the analytical approach so far developed to build a framework for viewing the behaviour of firms faced with a dynamic and uncertain environment.

Chapter 6 Case Study A: Fujitsu-ICL

Chapter overview

In 1990, Fujitsu, a Japanese producer of communication systems, computers and information processing systems and electronics devices, acquired ownership of ICL, the UK's largest computer systems company.

Fujitsu had been working on various collaborative projects with ICL since 1981, when the British government had encouraged the near-bankrupt ICL to seek out a partner who would be able to provide the leading-edge mainframe computer processor technology that ICL lacked. Fujitsu had been able to provide such technology for the UK firm.

ICL had itself previously been acquired in 1984 by STC (Standard Telephone and Cables), who had aimed to use the acquisition to form the foundations of what was hoped to become one of Europe's leading communication and information systems groups. However, STC lacked the resources to follow through this strategy, and in the late 1980s, decided to divest itself of the majority of ICL shares. Interest in acquiring was shown from many parties, including Nixdorf, Philips and Olivetti, but it was Fujitsu who eventually acquired 80% of ICL shares from STC.

Since acquisition ICL has gradually been transforming itself into an IT systems integrator and services company, operating to a large extent autonomously within the Fujitsu group of companies.

Note: To aid the readability of the case study material, all citations are given as footnotes.

Fujitsu

The major businesses of Fujitsu can be grouped as the manufacture and sales of communication systems, information processing systems, electronic devices and related services (See Exhibit 6.1)[90]. The company has net sales of over US$36 billion derived from operations world-wide which in total employ over 160,000 people. More than half of Fujitsu's manufacturing sites are located outside Japan, although around 70% of sales are still derived from the Japanese market (See Exhibit 6.2).

	1988	1990	1992	1994
Computers and information processing systems	67	66	73	68
Communications systems	16	15	13	16
Electronic devices	13	14	10	13
Other operations	5	4	4	4
Total	**100**	**100**	**100**	**100**

Exhibit 6.1 Fujitsu's main product areas by percentage sales
Source: Fujitsu Company Reports[91]

	1988	1990	1992	1994
Japan	78	76	70	71
Asia & Oceania	3	4	4	6
The Americas	13	13	10	8
Europe	6	6	16	15
Africa & Middle East	0.35	0.30	0.58	0.65
Total	**100**	**100**	**100**	**100**

Exhibit 6.2 Fujitsu's percentage sales by region
Source: Fujitsu Company Reports

[90] Further details of the product range are given in Appendix III.

[91] Note: rounding errors may mean that figures do not add up to 100 in Exhibits 6.1 and 6.2.

Company background[92]

Fujitsu was formed in 1935 as a spin-off from the communications division of Fuji Electric[93], a leading electric machinery and vending machine manufacturer, and member of the Furukawa *zaibatsu*[94]. Fujitsu was formed during the development of Japan's pre-World War II telecommunications infrastructure to produce telecommunications equipment under license from Siemens AG of Germany.

In the 1940s and 1950s, Fujitsu's main operations centred on the manufacture of telephones, telephone switching systems and telephone carrier systems. The slow post-war rebuilding of Japan's communications was given a huge boost by the outbreak of the Korean war. Fujitsu succeeded in producing the first all-Japanese telephone (in collaboration with NEC, Oki Electric and Hitachi). With switching systems, Fujitsu maintained its links with Siemens, despite opposition from Japan's Nippon Telegraph and Telephone Public Corporation[95] which favoured rival US technology. Fujitsu was eventually forced to comply with the NTT standards. Competition among the other Japanese telecommunications suppliers was strong, and the management of Fujitsu realised that they needed to develop new skills to compete in new market areas.

One opportunity that showed potential stemmed from the increasing trading volumes of the securities market in Tokyo. This had led to the demand for a more streamlined trading system to replace the existing one which relied on all transactions being dealt with by hand. Fujitsu developed a "stock trading volume computation-use calculator", based on punch-card technology to respond to this need. For various reasons, this product was not a success, but spurred-on Fujitsu's development teams to producing a fully fledged "computer".

---

[92] The material presented here relating to the history of Fujitsu draws heavily on the memoirs of the present chairman of Fujitsu, Takuma Yamamoto (Yamamoto, 1992).

[93] This spin-off was originally named the Fuji Communication Apparatus Manufacturing Company Ltd., or *Fuji Tsushinki.* Fuji Electric remains Fujitsu's principle external shareholder.

[94] The *zaibatsu* were the pre-World War II industrial and financial conglomerates that dominated Japan's industry (Ohsono, 1995).

[95] Now the NTT Corporation

Fujitsu's entry into the computer industry[96]

Fujitsu's first computer, the relay-based FACOM 100, was completed in 1954 with the aid of Government funding. This machine, as with all early Fujitsu models, was non-compatible with those developed by the world market leader IBM. Following the failure to secure a major contract to supply computers to the University of Tokyo in the 1960s (an IBM compatible system from Hitachi was chosen), the decision was made by Fujitsu to shift the direction of the firm's computing strategy towards the IBM-compatible route. This was eventually to lead to the development of a very successful series of "plug-compatible" (PCM)[97] computers, which pushed Fujitsu on to dominate the Japanese computer industry.

In 1969 the decision was taken by the then President of Fujitsu, Kanjiro Okada to "stake the future of the company on computers"[98] and to spin-off resources to allow responses to changing technology. It was also at around this time that Japan's Ministry of International Trade and Industry (MITI) decided to set in motion plans to strengthen the domestic computer industry. This led to the formation of tie-ups between Fujitsu and Hitachi, as well as NEC and Toshiba, and Oki Electric and Mitsubishi Electric.

Once the decision had been made to go down the IBM-compatible route, Fujitsu needed to acquire skills in the relevant technologies. Unlike its domestic competitors in the computer industry, Fujitsu was the only Japanese computer firm who had not formed a technical agreement with a non-Japanese partner in order to gain manufacturing competences and software. Following unsuccessful approaches aimed at obtaining direct co-operation from IBM (the US company would only consider 100% capital participation in technology transfer projects and Fujitsu had no intention of allowing itself to become a subsidiary of IBM) Fujitsu at first attempted the development of an IBM-compatible

---

[96] The entry of Fujitsu into the computer industry is covered in detail by, amongst others, Anchordoguy (1988), Fransman (1990), and Yamamoto (1992).

[97] Computers from third-party manufacturers which were able to work with (or 'plug-in' to) IBM proprietary hardware.

[98] Yamamoto (1992:120).

computer without a non-Japanese partner[99]. However, a partner was finally found in the form of the Amdahl Corporation. This US firm had been formed in the early 1970s by Gene Amdahl, an ex-IBM engineer who had been responsible for the development of some of IBM's most innovative and successful products. Amdahl had run into financial troubles in 1972, and Fujitsu was able to provide the US firm with funds in return for access to Amdahl's technology[100]. The technology for Fujitsu's PCM computers was thus developed in co-operation with both the Amdahl Corporation in the US and Hitachi in Japan.

Now that Fujitsu had a mainframe computer that was fully compatible and competitive with those produced by IBM, the global market leader, Fujitsu was able to build a strong position in the domestic market and to attempt to push into international markets. Fujitsu's sales and profits continued to grow through the 1970s and 1980s, though with the majority of sales still being drawn from the Japanese domestic market. The company grew to become the second largest producer of computer systems world-wide, and gained the often-used label of 'Japan's IBM'. Fujitsu moved into the production of smaller computers for the Japanese market, and was able to leverage its wide business mainframe customer base to ensure that the small machines achieved top-three ranking by sales in the domestic market (See Exhibit 6.3).

1990 domestic sales ranking	***Mainframe computers***	***Office computers***	***Personal computers***
1	Fujitsu[101]	Fujitsu	NEC
2	IBM	NEC	Fujitsu
3	Hitachi	IBM	Toshiba

Exhibit 6.3 Fujitsu sales in personal, office and mainframe computers for 1990
Source: Nikkei Japan Economic Almanac, 1992

[99] "By the time IBM rejected Fujitsu's overtures, the most appropriate foreign partners had already been taken, so Fujitsu decided to go it alone as Japan's only pure-blooded (*junketsu*) national computer firm. Fujitsu made the earliest and most substantial commitment to computers, and was the only Japanese company that would stake its survival on its ability to make computers; [..]" (Anchordoguy, 1989: 24).

[100] Between 1972 and 1976, Amdahl received $54 million in capital and loans from Fujitsu (Anchordoguy, 1989).

[101] Fujitsu, at this time, had 12% of the global market, compared with IBM's 44% (*The Independent*, 6/8/90).

Impact of changes in the computer industry

The changes in the computer industry detailed earlier in Chapter 2 impacted hard upon the strategies of all firms operating in the mainframe sector of the industry, and Fujitsu was no exception. The shift to open systems based computing in business markets and the growth of the PC generally forced Fujitsu to re-think its strategy. The Japanese firm saw itself in a stronger position than many of both its Japanese and non-Japanese competitors for reasons which can be summarised as follows:-

- Fujitsu had strengths in telecommunications and semiconductors which it was hoped would allow the company to 'buy time' to redefine itself as a force in open systems based computing[102]. Though suffering from a slump towards the end of the 1980s, the demand for memory semiconductors was predicted to pick up as the demand for PCs and network servers grew. Fujitsu's strengths in fast telecommunication switches (such as those based on ATM technology) was predicted to provide the company with a strong competitive advantage as the demand for computer networks able to cope with high bandwidth data transfer increased.
- The uptake of open systems based computing had been slower in Japan than elsewhere[103]. This was a positive factor for Fujitsu, as it was continuing to derive over half of the company's revenue from mainframes[104], and around 70% of all sales from the domestic market[105]. Fujitsu's strong and loyal domestic mainframe customer base was hoped to be able to provide a buffer as the firm developed the required competences and moved into open systems based systems.
- Fujitsu had developed its own range of PCs using proprietary operating systems for business and home uses, which had achieved high levels of penetration in the domestic

[102] *Nikkei Weekly*, 13/9/93.

[103] *Computer Weekly*, 1/4/93.

[104] *Nikkei Weekly*, 13/9/93.

[105] Fujitsu company reports.

market[106].

However, even given the time buffer provided by these factors, Fujitsu still needed to develop the ability to compete in the market for open systems computing to allow the firm to compete effectively in what was widely realised to be a fast changing international IT environment.

For a firm such as Fujitsu whose IT skills rested predominantly with provision of high cost, low volume, large computer systems, the shift in the nature of the IT industry towards high volume, low margin machines posed a challenge. For firms aiming to compete in the market for the provision of small, open architecture computers, high volume was essential. In order for Fujitsu to achieve high volumes on a global scale, the Japanese firm needed to be able to have an international network of manufacturing capacity.

A wider trend was also becoming clear towards the end of the 1980s. As the margins on the smaller computers became ever narrower, and the nature of the products themselves more generic in nature, it became clear that it was in the provision of software and services where the high potential for growth lay:-

> Taking a 20 year view, it was becoming pretty clear to everyone that the IT industry is becoming a service-based industry sitting on technology which was important, but which is gradually becoming more of a 'commodity' in nature[107].

While the uptake of open systems based computing and demand for open-architecture PCs may have been slow in Japan, the situation was very different in Europe and North America. Fujitsu wanted to tap into the skills of alliance partners who were already operating in the fast growing client-server, PC, and related service markets. Fujitsu's network of alliances around the world were a rich source of potential capacity and resources. Links with non-Japanese firms including Amdahl, Sun Microsystems, ICL,

---

[106] The home-use PC, 'FM-Towns', incorporating a CD-ROM drive was technologically very advanced when introduced. However, it proved to be an example of Fujitsu pushing technology towards the consumer, regardless of whether there was demand. "The consumers couldn't catch up with that level of technology. It was trying to pre-empt the market, but it was just too early" (Interview with Aida, 14/3/96).

[107] Interview with Davison, 28/2/96.

Acer and AT&T were all regarded as potentially useful sources of client-server, open system and open architecture PC related competences. Such competences included UNIX operating system development skills, high performance network server processors and open-architecture PC manufacturing capacity.

This was the situation facing Fujitsu in the late 1980s. At the same time, the majority shareholder of ICL (one of Fujitsu's main alliance partners), was expressing a desire to divest itself of ownership of the UK firm. This posed a problem for Fujitsu; while ICL's majority shareholder, STC, had been willing to allow the close relationships to exist between Fujitsu and ICL, a new owner for ICL might not be so willing to allow the collaboration to continue. If the relationships were to be ended, Fujitsu would lose access to a rich source of open systems competence it badly needed.

ICL

Company background[108]

ICL was formed in 1968 as the result of a merger between International Computers and Tabulators (ICT) and English Electric, with equity stakes being held by Plessey and the Ministry of Technology (See Exhibit 6.4). This was a government inspired merger to strengthen the UK computer industry in its competitive battle against the dominant US computer industry headed by IBM.

In the early 1970s, IBM made the decision to perpetuate its System/360 mainframe architecture indefinitely. Those firms attempting to compete in the mainframe market were faced with a simple choice; either conform to the market leader's standard, or opt for a differentiated product. ICL took the latter option, and stuck with its 2900 series of mainframes[109]. The UK firm struggled through the early 1970s with the assistance of government financial support for R&D expenses. ICL was faced with attempting to recoup massive R&D costs from a tiny market share. However, supported by public

[108] This background to ICL draws heavily on the 'official' history of the company provided by Campbell-Kelly (1989).

[109] The development of this 'new range' of computers while maintaining the product lines of the previously separate ICT and English Electric Computers had seriously weakened the company financially (Emery, 1995).

sector funds, by 1978, ICL displayed revenue growth of 22% and profit growth of 23% - the highest of any company in the industry except for DEC and Fujitsu[110]. ICL's share value almost doubled between the beginning and end of 1978. Based on such encouraging financial figures, it was decided to begin implementation of a five year high-growth strategy.

Shareholder	% of ordinary shares
English Electric	18.0
Plessey	18.0
Vickers	12.6
Ministry of Technology	10.5
Ferranti	5.7
Other ex-ICT shareholders	35.2
Total	**100**

Exhibit 6.4 Initial Ownership of ICL
Source: ICL Press Office

In 1979 IBM responded to the emerging competition from producers of mainframes compatible with System/360 ('plug-compatible machines', or PCMs) by introducing a new, technologically advanced range of computers. This 4300 Series of mainframes had dramatic improvements in price:performance compared with Systems/360 models and related products from PCM producers. The effect of this was to drive a number of PCM manufactures into loss, and made the environment for non-PCM producers such as ICL extremely difficult. ICL was forced to cut costs as it sought ways to compete with this new competition from IBM. IBM's strategy forced ICL to assign even greater proportions of its budget to R&D in order to keep in competition with IBM and achieve the planned levels of growth.

With a change of government from Labour to Conservative in 1979, direct financial support for R&D from the public sector became harder to come by. Mrs Thatcher's Conservative government had pledged to distance itself from direct involvement in the

[110] Campbell-Kelly, 1989.

computer industry. Coupled with this, the UK recession of 1980-81 made the competitive situation for ICL extremely harsh. By 1981, ICL was facing a major crisis. Talks were held with various firms, many of which were based in the US but including Fujitsu, with respect to merging. It became clear that most of these firms were only interested in acquiring ICL's European customer base to extend their own operations.

ICL was given a reprieve by the UK government, who stepped in at the last moment in 1981 to prevent the UK's largest remaining indigenous computer firm from failing. The government provided financial support by agreeing to act as a guarantor for a £200m loan. This loan came with the condition that there be a major change in the management structure. New people were bought in from outside to form a new management team, two of the most influential coming from Texas Instruments in the US; Robb Wilmot, who was brought in to be managing director, and Peter Bonfield as his second-in-command.

The new management instigated a major cost-cutting programme and re-orientated the company dramatically. The new management realised that ICL could no longer develop all its own technology, and had to become much more in tune with the end users of the products and services they were aiming to provide:-

> We had to re-think the company from being a vertically integrated product company, to a company that bought-in a lot of its technology on a best-of-breed basis, we became much more customer-, and market-focused[111].

ICL's new strategy encompassed the marketing of complete systems and the promotion of a 'new ICL'. The image that ICL had up until that point presented to the customers was not one that the new management were keen to perpetuate:-

> The chief [ICL] salesman for a region, it was said, would put up in the best hotel and announce he would be available that evening in the parlour to take customer's orders for computers[112].

The resulting new strategy had four key components[113]:-

1. *Focus* - with sales only one fiftieth of those of IBM, ICL was unable to derive

---

[111] Interview with Davison, 28/2/96.

[112] *Financial Times*, 16/3/94.

[113] As summarised in *The Economist*, 9/8/86.

sufficient revenue to allow it to compete effectively across a wide range of computer products. Instead, resources were to be focused on a small number of markets which included local government, retail stores, defence and office automation. Small groups of around 100 people were to focus on specific markets.

2. *Collaboration* - in order to get the most from limited resources, ICL was to make strenuous efforts to find partners who would be able to assist the UK firm in the achieving of its goals[114].

3. *'Europeanisation'* - ICL was to attempt to tap into the European markets for industrial automation and retail IT products.

4. *Standards* - by backing the emerging standards of Open Systems Interconnection (OSI) and AT&T's UNIX operating system, ICL hoped to be able to minimise barriers which might isolate its products from potential customers.

Mainframe sales at that time were virtually static producing only 1/3 of turnover, yet consuming 2/3 of R&D expenditure[115]. The cost of developing VLSI[116] semiconductor technology for a new range of mainframes would have been prohibitive, and so the new management team set up negotiations with Fujitsu to access the Japanese firm's mainframe semiconductor technology, which was widely regarded to be the best of its kind at that time.

The resulting collaborative agreement allowed ICL access to Fujitsu's core mainframe technology and in return, ICL agreed to market Fujitsu mainframe computers in Europe. This provided an almost ideal solution to both companies' problems; ICL's lack of R&D resources to develop a new range of semiconductor technologies required for a new range of competitive mainframes (the Series 39), and Fujitsu's problem of gaining a foothold in the European market. There was surprise and admiration for ICL at having pulled-off

---

[114] Peter Bonfield stated in 1986 that ICL would actively seek out partnerships wherever possible as an alternative to merging with another large firm. He gave three courses of action which were preferential alternatives to mergers and acquisitions for ICL: (1) joint ventures, (2) start-ups and (3) spin-offs (*Financial Times*, 5/11/86).

[115] ICL company reports.

[116] Very Large Scale Integration. A high number and dense packing of transistors on each silicon wafer.

such a coup:-

> The ICL-Fujitsu agreement was perceived as an exceptionally innovative solution to ICL's mainframe challenge, and has since come to be regarded as a classic example of technology transfer in the 1980s[117].

In addition to the acquisition of mainframe semiconductor technology from Fujitsu, ICL was shifting resources into areas connected with the development of open systems based computing, and most importantly, PCs. ICL's 'Networked Product Line' began to be filled with a range of products obtained from acquired companies, or licensed from outside companies ranging from Psion to Sinclair, and Singer to Rair. ICL's new management had identified the shift in the IT industry away from mainframes to smaller networked machines, and was keen to encourage 'open network standards' which would allow hardware and software from different companies to work together on the same network. By focusing efforts in this way, ICL became one of the dominant forces in promoting open systems standards in the European market.

One emerging product area that was allocated resources by the new management team was that of the use of IT in the retail sector, and in particular, the use of point-of-sale (PoS) laser bar-code scanning technology. ICL lacked much of the basic technology required, but Fujitsu proved to be a useful partner and was able to provide what ICL lacked[118].

> We [ICL] didn't have the capital available to us to do the basic engineering required for the scanning technology and PoS hardware technology which were needed to build the business. Fujitsu [..] widened the [mainframe technology] agreement, whereby they built to our design the PoS scanning technology[119].

This collaboration resulted in Fujitsu and ICL sharing the development of PoS systems which were then marketed by both companies around the world. This sector proved to be very successful for ICL, building on early successes of a £20 million business in 1983 to

---

[117] Campbell-Kelly, 1989:342.

[118] Fujitsu were not the only firm able to supply the required scanning technology, but owing to the mainframe technology agreement, Fujitsu was "on ICL's radar screen" (Interview with Davison, 28/2/96).

[119] Interview with Davison, 28/2/96.

a £500 million business a decade later. Under the new management, ICL moved from a £50m loss in 1981 to a profit of £24m in 1982, and thereafter continued to achieve year-on-year increase in profits (See Exhibit 6.5).

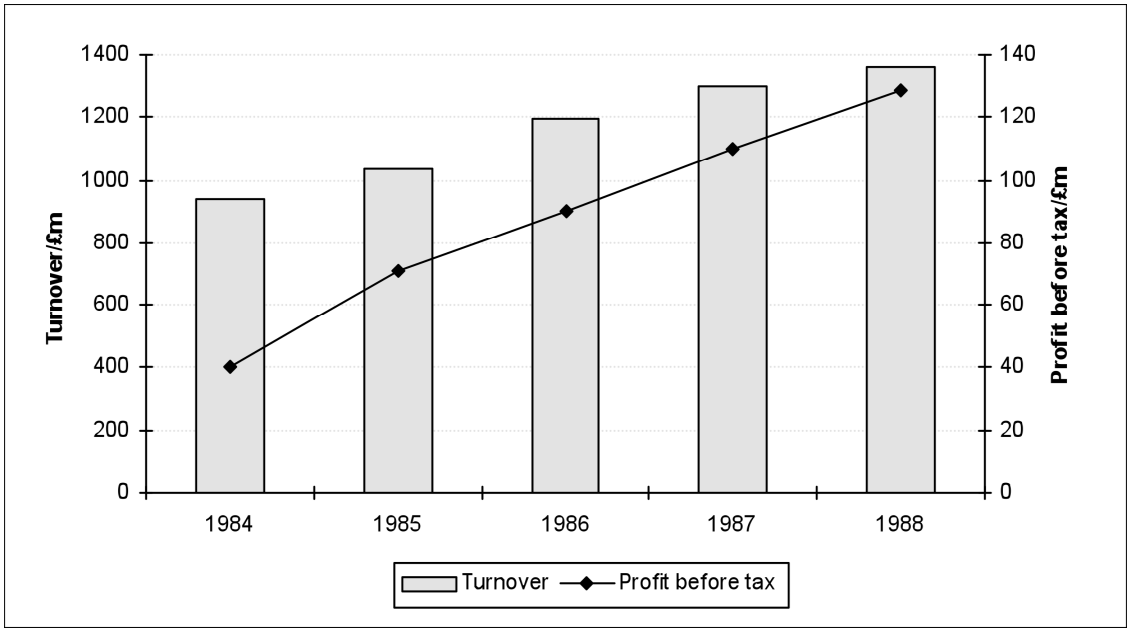


Exhibit 6.5 ICL's turnover and profits 1984-1988
Source: Company reports

In 1984, Standard Telephone and Cables (STC), a telecommunications, electronic components and defence systems producer, realising the potential of the increasing convergence of computing and telecommunications, made a bid to acquire ownership of ICL. This posed potential problems for the collaborative agreement between ICL and Fujitsu. A clause had been written into the original partnership agreement that gave Fujitsu the right to terminate the partnership if the ownership of ICL changed. As STC was a competitor of Fujitsu in the telecommunications business, this could have presented a major problem for the Fujitsu-ICL collaboration. Vitally for the UK firm, following intense negotiations, Fujitsu agreed to allow the collaboration to continue with ICL under the new ownership of STC.

STC flourished in the late 1980s as the UK's post-deregulation telecommunications boom continued and demand for STC's cable and telecommunication equipment grew. However, into the 1990s, STC's profits were beginning to fall as demand decreased and

key orders fell through[120]. STC had been unable to find ways of deriving synergistic benefit from having interests in both sides of the converging fields of telecommunications and computing. Press reports talked of rumours that STC was looking for a buyer for ICL[121]. Both STC and ICL realised that for ICL to grow, it needed "an owner with deeper pockets and greater commitment to the information technology business than STC"[122]. The reasons for STC wishing to divest itself so eagerly of ownership of ICL remain somewhat of a mystery, according to press reports around the time of acquisition[123]. With the computer industry dominated by IBM, and telecommunications by AT&T, STC may have realised that it did not have the resources to compete successfully in both areas[124].

Acquisition

Once the news had emerged that STC was looking to divest itself of its majority interest in ICL, negotiations began in earnest with a number of likely partners (See Exhibit 6.6). One key factor overrode all negotiations; as mainframes were still an important component of ICL's return to profitability, continued access to Fujitsu's mainframe technology was essential for ensuring the UK company's continued success. The technical collaboration agreement between Fujitsu and ICL which assured this access, contained a crucial clause: Fujitsu retained the right to veto any company's attempt to acquire more than 20% of shares in ICL[125].

1989	
February	STC starts negotiations with Olivetti about pooling their computer interests in a joint venture.
March	Exploratory discussions with Nixdorf and Philips
September	STC approaches Fujitsu about taking a minority stake in ICL.
October	Olivetti talks break down after disagreement over which group should be in control.

120 *Financial Times*, 31/7/90a.

121 *Newsweek International*, 30/7/90.

122 *Financial Times*, 16/3/94.

123 *Financial Weekly*, 3/8/90.

124 *Financial Times*, 31/7/90b.

125 *Financial Times*, 1/8/90.

November	Discussions resume with Nixdorf, but the German company is facing financial problems and is taken over by Siemens.
December	Fujitsu talks intensify.
1990	
January	Olivetti talks resume, but peter out over concern whether Fujitsu technology would be available to the merged group.
February-July	Negotiations continue with Fujitsu, interspersed with flirtations with Bull, NCR, Siemens and Digital Equipment.
August	Fujitsu acquire 80% of ICL.

Exhibit 6.6 Chronology of the negotiations
Source: Financial Times, 1/8/90

Discussions spread to include companies such as Bull, NCR, Siemens (who had acquired the now-ailing Nixdorf) and Digital. The growing intensity of negotiations with Fujitsu prompted fears to be expressed in the media as to the dangers of letting control of Britain's largest indigenous computer manufacturer slip to Japan.

Fujitsu seemed well aware of the power of public opinion and the sensitive nature of international corporate acquisitions as Fujitsu had faced problems in the US when attempting to acquire Fairchild Semiconductor[126]. The chairman of Fujitsu, Takuma Yamamoto, instigated investigations of public and private sentiment in the UK towards the idea of what he called one of the UK's "historical and cultural jewels" falling into Japanese hands. The results of these investigations were sufficiently positive from Fujitsu's standpoint for such issues not to be considered as a major stumbling block. Japan's MITI was also consulted for advice as to potentially "troublesome" areas. Mrs Thatcher's visit to Japan in 1989 which was planned so as to include a tour of Fujitsu's Numazu plant may have had some influence on shaping perceptions. In the words of one Fujitsu director:-

> The fact that the very busy Prime Minster Thatcher visited us in fact symbolises the status of the Fujitsu-ICL relations. [It was] a very precious visit[127].

[126] Anchordoguy (1989); Yamamoto (1992).

[127] Toshio Hiraguri, quoted in *Computer Weekly*, 2/8/90.

The option for Fujitsu to acquire around 50% of ICL shares was rebuffed by the Japanese firm, as it was only interested in being a clear majority owner. One Fujitsu director talked of the lessons learned from previous joint venture partnerships where ownership had been split 50:50. Such a split of decision making is "always very difficult, especially at critical moments"[128]. Furthermore, STC were not interested in selling less than a significant stake in ICL[129].

After a negotiation period lasting over a year, the deal was struck between STC and Fujitsu, whereby Fujitsu would acquire an 80% stake in ICL for a cost of £743 million. STC would hold on to the remaining 20%, with a provision to prevent that 20% falling into 'hostile' hands in the event of STC being itself acquired[130]. The intention was stated that ICL would be floated on the stock exchange at some appropriate time in the near future.

Motives for the acquisition

Fujitsu's motives in the late 1980s for wishing to strengthen its ties with ICL, though not necessarily acquire a majority shareholding, can be summarised as follows:-

- *Globalisation* - Fujitsu, in common with other Japanese IT companies realised that in order to compete successfully on an international level, they would have to strengthen their position in non-Japanese markets. To do this, they needed to gain competences in hardware and software that conformed to international open standards[131]. Forming links with non-Japanese firms was an effective way of doing this[132]. Fujitsu had little choice but to become more deeply involved with ICL if it wanted to become a true

---

[128] "Fujitsu has had some bad experiences. We made an alliance with a US company and split ownership fifty-fifty. So there was no majority and unclear responsibilities. Both companies blamed each other for the problems that occurred, responsibilities were ambiguous, so it ended up failing. So after that, we made a decision that in the case of alliances we would always make it clear who takes the leadership" (Interview with Kitazato, 11/1/94).

[129] *Financial Times*, 1/8/90.

[130] *Financial Times*, 1/8/90.

[131] Interview with Yurino, 14/3/96.

[132] Japanese firms involved in tie-ups in 1990 included NEC with Bull and Honeywell in the US, and Hitachi with its tie-ups with EDS in the US and Comparex and Olivetti in Europe (*Computer Weekly*, 26/7/90).

competitor to IBM[133].

> Fujitsu's approach to globalising its computer business is both novel and bold. It is attempting to take strategic stakes in different companies to acquire different skills. In the past nine years, it has set about learning ICL's skills very well[134].

- *Avoidance of trade barriers* - If Fujitsu wanted to become truly global in operation, it needed to have a strong foothold in key markets. Having a subsidiary operating within a key market was one way to avoid potential or actual trade barriers. This was a key motive for Japanese firms attempting to compete within the markets of the European Union. Japanese companies were eager to merge with European operations to gain a firmer presence in the run-up to 1992 and the formation of the single European market[135]. ICL, with strong operations in Europe, could be used as a base for Fujitsu to attack US and European markets[136].
- *Widened customer base and increased production capacity*- ICL had a wide customer base in Europe, something that Fujitsu lacked. The UK firm also had highly regarded competences in computer manufacturing. This was especially important for Fujitsu, who needed to have manufacturing operations close to all major markets to counteract the affect of the appreciating Yen[137].
- *Skills in software and systems networking* - Fujitsu badly needed expertise in software and systems networking to allow it to compete in the growing international markets for open systems based computing. These skills were only available outside Japan[138]. ICL's strength in UNIX machines, used for running networks of small computers (especially the DRS 6000) backed by Fujitsu's financial 'muscle' could provide Fujitsu with a large share of Japan's UNIX market, estimated to be worth around

---

133 *Computer Weekly*, 26/7/90.

134 Peter Bonfield, as quoted in *Financial Times*, 31/7/90b.

135 *Financial Weekly,* 27/7/90.

136 *Electronics Weekly*, 8/8/90.

137 Interview with Aida, 14/3/96.

138 *Computer Weekly*, 26/7/90.

US$3.5 billion at the time of acquisition[139].

Arguably, all these benefits could have been accrued with ICL remaining a partner, rather than a subsidiary of Fujitsu. In fact, fears were expressed that the performance of ICL would suffer if it were to be "controlled in every major decision from Tokyo"[140]. The ICL Fujitsu relationship up to the time of acquisition had been one which relied heavily, though somewhat one-sidedly, on co-operation. While STC had been happy to stand on the sidelines and not interfere, it was possible that a new owner would not show similar restraint. It was also widely recognised that ICL's recovery in the 1980s had been heavily dependent upon support from Fujitsu, and Fujitsu had invested a great deal in the company in the form of transferred technology and tacit knowledge. To have that investment passed on to a prospective new owner, who was potentially hostile towards Fujitsu left the Japanese firm with little alternative than to step in and take control once STC had made its wish to divest itself of ICL clear. As can be seen from the chronology of acquisition given earlier in Exhibit 6.6, the Japanese firm chose acquisition of the majority stake in ICL very much as a last resort, when all attempts to maintain a minority shareholding had proved fruitless.

Post acquisition

Once the decision to go ahead with the acquisition had been finalised, albeit reluctantly, Fujitsu was keen to stress that ICL would be allowed to run as an autonomous company within the Fujitsu federation of companies. Fujitsu identified a number of issues and principles which it hoped would define the Fujitsu ICL relationship. Firstly there were the three 'critical issues' summarised by Kitazato & Trevedi (1995):-

- *National identity* - Fujitsu seemed well aware of the sensitive nature of the UK's largest remaining computer firm falling into the hands of the Japanese and were keen to play this aspect down as much as possible. Fujitsu was very eager to portray ICL as a European company, not as a European subsidiary of a Japanese company.

---

[139] *Computer Weekly*, 2/8/90.

[140] Anonymous STC shareholder, quoted in *The Guardian*, 17/8/90.

- *Management structure* - Fujitsu was well aware that it was not only their technology that had allowed ICL to achieve such a marked turnaround in performance in the 1980s. The management team brought in at that time, and now headed by Peter Bonfield was highly regarded by the Japanese. Fujitsu wanted therefore to maintain the culture of ICL within the Fujitsu group. Given the problems of integration faced by any companies following a merger or acquisition (as highlighted earlier in Chapter 3), this was going to be no easy task to achieve.
- *Maximum synergy* - The combining of Fujitsu's and ICL's strengths to produce synergistic benefits was stressed as being a critical issue by Fujitsu for the success of the acquisition.

In relation to these three critical issues, immediately after acquisition, the management teams worked together to produce five key principles for defining Fujitsu's relationship with ICL (Kitazato & Trevedi, 1995)[141]:-

1. *Autonomous management* - ICL was to be left to set its own strategic direction, financial management and personnel management.
2. *Arm's length operation* - Fujitsu was to maintain its distance from ICL as much as possible with respect to the operations of the UK firm.
3. *European identity for ICL* - As pointed out above, it was very much in the interests of both Fujitsu and ICL for ICL to remain to be perceived as a European company.
4. *Maximum synergy* - In order to 'activate synergy', Fujitsu was not to force its way upon ICL. ICL's strengths were to be played upon in a way so as to achieve some unperceived benefit when placed in conjunction with Fujitsu's strengths.
5. *Mutual goal* - Fujitsu announced its intention to have ICL floated on the stock exchange within five years of the acquisition.

The relationship between the two firms is defined by Fujitsu as existing in three distinct

[141] Also, interview with Kitazato, 11/1/95.

areas: the shareholder relationship, the technology agreement and the business partnership142.

While Fujitsu was the majority shareholder, ICL was left to operate "as a PLC in every respect"143 Fujitsu maintains only one director in London who resides on the board of ICL and who is responsible for relationships between the two firms.

The original agreement for technology collaboration which brought Fujitsu and ICL together has been revised since the acquisition. The agreement was extended to include free royalty and free licensing of intellectual property rights in both directions. Fujitsu and ICL were to maintain a commercial relationship, in terms of ICL selling products and components to Fujitsu and visa versa. If the products offered by either partner were not considered competitive, then neither was obliged to take the other's products or components.

In the following section, the ways in which ICL and Fujitsu have operated together since the acquisition is examined in a number of areas. Examples of specific projects are used to act as illustrations rather than provide an exhaustive listing of all that has happened between the two companies since 1990 and up to the time of writing.

Integration issues

Having been effectively forced to acquire a majority stake in ICL in order to prevent a valued alliance partner potentially falling into the hands of a competitor, Fujitsu was then faced with the challenging task of integrating the acquisition. Of the spectrum of integration options discussed in Chapter 3[144], Fujitsu opted for a process of structural integration, i.e., as far as possible, the identity of ICL was to be kept intact. The five principles announced by Fujitsu immediately following the acquisition provided a basis

142 Interview with Kitazato, 11/1/95.

143 Kitazato & Trevedi (1995).

144 In summary, these options are: (1) *assimilation*, where one party adopts the identity of the other. This can be either forced or voluntary; (2) *novation*, where the two organisations combine and a new identity is created; (3) *structural integration*, where each organisation keeps its own identity, with each accepting the validity of the others working practices (Schweiger *et al.*, 1993).

for the integration process, which was carried out in an evolutionary manner.

> Much of ICL's value lies in its engineering creativity, which would suffer if the company were simply milked of existing technology or subjected to heavy handed treatment from Tokyo[145].

While it would have been possible, and in many ways quite logical to rationalise certain functions across the group as fast as possible, Fujitsu opted not to do this.

> While it would have made more sense to have a singular PC range and common UNIX servers across the group, [Fujitsu] haven't pushed at all. The attitude has been one of 'companies that grow together, stay together'. Companies that are forced together more often than not end up 'divorced'[146].

Fujitsu seemed well aware of how delicate the situation was with respect to the integration of the acquisition. While Fujitsu had professed in the past to giving subsidiaries 'a free hand', this had not always been achieved in reality, as described by one Fujitsu director:-

> Fujitsu will always ask the subsidiary to go their own way, but sometimes, quite frankly, the Fujitsu subsidiary will suffer some problems, either financially, or in some other way. Then, Fujitsu must step in and tell them what to do. But with ICL, it has been very different. ICL has been a very good company managerially, financially and technically. Because of that, we thought that Fujitsu should really should have an arm's length stance. Normally for a Japanese company, they will send a significant number of people from Japan to the UK, and they position the Japanese people in key areas, but Fujitsu didn't do that with ICL. We gave the ICL management a good deal of trust[147].

The fact that ICL had been the largest remaining UK owned computer company made the integration process somewhat sensitive. Around the time of the acquisition, newspapers reflected the disquiet felt as "Japanese invaders claim computer prize"[148] resulting in the loss of Britain's "technological independence" which was a "national tragedy"[149].

This disquiet was reflected in the expulsion of ICL from joint European 'JESSi' and 'Esprit' R&D programmes into semiconductors and information technology. The reason given for ICL's expulsion was that information on these R&D projects, designed to

---

145 *Financial Times*, 27/7/90.

146 Interview with Davison, 28/2/96.

147 Interview with Watanabe, 16/11/95.

148 Headline from the *Daily Express*, 31/7/90.

149 Francis Lorentz, Chairman of France's Groupe Bull, quoted in the *Newsweek International*, 30/7/90.

strengthen Europe's semiconductor technologies, might find its way back to Fujitsu[150]. The view of the European partnerships was expressed as follows:-

> This is a European project and we rely on European companies. [..] the Fujitsu ICL link-up is not good news for European companies as it shows the weakness of Europe's position in micro-electronics and computers[151].

ICL being a UK-based, rather than a US-based company made the integration process in some ways easier for Fujitsu. The Japanese firm had experienced a number of problems operating in the US, most notably with Amdahl[152], but had found the process of working with ICL over the previous nine years much less prone to difficulties[153].

Within ICL, there was concern as to how ICL would function now that it was no longer a partner of Fujitsu, but a subsidiary:-

> At the time of the acquisition, there was a certain nervousness among the ICL management team as to how it [the acquisition] was going to be. It turned out to be on the better side of the best view we had of how it might be[154].

The respect of ICL's management for Fujitsu grew as it became clear that the acquisition was not going be managed in a heavy handed manner:-

> Fujitsu [..] know what they know, and they know what they don't know. They know that they don't understand how predominantly English speaking, Western cultural societies operate, and how business in that society operates. [Fujitsu realised that] once you get away from supplying raw technology, such as TV sets which are consumed throughout societies without needing to understand how the society operates, and move up the value chain, you have to tailor your offerings to what different societies want. [..] Fujitsu understand very deeply how Japanese society operates, but if they have to make value judgements as to how to enter [other] markets, then unless it was a commodity technological product that they were taking, then they would probably get it wrong[155].

Despite the desire to keep ICL operating as an autonomous unit and not to interfere in any way that might disrupt the relationship between the two firms, a number of steps were

---

150 *Electronics Weekly*, 19/9/90.

151 JESSi spokesman, quoted in *The Independent*, 4/8/90.

152 Yamamoto (1992).

153 Interview with Kitazato, 11/1/95.

154 Interview with Davison, 28/2/96.

155 Interview with Davison, 28/2/96.

taken to smooth the process of transformation of ICL from collaborating partner to wholly owned subsidiary without interfering with ICL's independence. These included the setting up of exchange programmes to allow the engineers from the UK to work in Japan, and Japanese engineers to work in the UK. Also, the process of communication between staff in the UK and Japan has been consolidated through the combined use of the 'Fujitsu network', i.e., use of international, intra-company telephone links, widespread operation of e-mail, and the regular use of video conferencing between the UK and Japan.

The role of the person who acts as the main link between the two firms, based in ICL HQ in London has been crucial, as is described by the incumbent at the time of writing, Hideo Watanabe:-

> I am the only resident director [of Fujitsu] here. Every week I attend the board meeting where we discuss the important operational things. Then, I report back to Tokyo what is happening every week. Sometimes I seek Fujitsu's comments on that, but basically I do not interfere or disagree with ICL management, because Fujitsu really appreciate Peter Bonfield[156], his staff and style of managing the company. But sometimes, for the very important strategic issues, such as the middle-term strategic plan, if Fujitsu were to stand a very big amount of money for the future, then [ICL] have to seek Fujitsu's approval[157].

The thinking that is often implicit in many take-overs (as discussed in Chapter 3) is that the company that is acquiring has won and the company that has been taken over has lost. Fujitsu made great pains to ensure that this view was not the one propagated in respect to ICL, and the result has been an integration described by one ICL insider as "the antithesis of a typical take-over".

Joint product development and marketing

Two examples can be used to show the ways in which Fujitsu and ICL have worked together on joint product development. The first of these is the development of point-of-sale (PoS) technology for use in the retail sector, 'TeamPoS'. The second example is the

[156] Then CEO of ICL.

[157] Interview with Watanabe, 16/11/95.

development of 'groupware'[158] software package, 'TeamWare'.

TeamPoS[159]

The origins of TeamPoS date back before the acquisition by Fujitsu to the early days of the Fujitsu/ICL collaboration in the 1980s. Realising the opportunity to be derived from the use of information technology within the retail sector, the management of ICL had pushed resources into the creation of products for this emerging business area. In order to set up the business, ICL had required access to technology from third party suppliers. As Fujitsu was at that time working with ICL to provide the basic mainframe technology for ICL, the Japanese firm became an option to be considered for the supply of the basic PoS technology. Fujitsu had shown itself to be able to supply the technology for ICL and was chosen for the development of ICL's PoS system. Fujitsu was also able to share ICL's development skills in the production of Fujitsu's own PoS system.

When the two companies joined in 1990, the retail functions of ICL and Fujitsu became closely coupled. Although ICL's PoS systems had become very successful and it would have been quite feasible for the UK firm to produce its own PoS technology, it was decided to stick with the basic technology from Fujitsu. The two sides now share the core technologies for PoS systems, which were branded 'TeamPoS'. TeamPoS is an architecture, embracing a whole family of products which offers the user the ability to configure systems to match requirements.

The development and procurement of components was carried out jointly by Fujitsu and ICL with manufacturing taking place in the UK and Japan. Fujitsu was keen for ICL to use Fujitsu's components, but ICL was less willing to do this. From ICL's viewpoint, some of Fujitsu's components were less competitive than those of outside suppliers and therefore were not the best for the project. An agreement was eventually reached whereby ICL was allowed to source from outside[160]. The splitting of responsibility within the

---

[158] Software which facilitates the linked operation of groups of people working on common projects.

[159] This description of the development of TeamPOS is based on an interview with the former head of ICL's retail business, John Davison (Interviewed 28/2/96).

[160] Interview with Watanabe, 16/11/95.

project was carried out as follows:-

> ICL is stronger than Fujitsu in the retail market sector, so ICL took the leadership role in marketing and product definition, but from a technology point of view, Fujitsu took the leadership role[161].

The finished products were, and continue to be branded as 'Fujitsu-ICL', and sold by ICL in Europe and the US, and Fujitsu for Asia and Japan. Fujitsu and ICL now rank as number 3 in the world-wide market for retail IT systems[162].

TeamWare

In May of 1991, ICL purchased Nokia Data, the information systems division of Nokia, Finland's largest quoted company. This provided ICL with Nokia Data's strengths in PC manufacturing, distribution and software. One key suite of software gained by ICL was Nokia Data's groupware. This was taken on-board by ICL and combined with ICL's own groupware to form a more functionally integrated version[163]. This product was then converted for the Japanese market by Fujitsu and achieved very good sales in Japan[164].

Much of the early development of TeamWare was carried out by ICL, but it was the perspective of the Fujitsu project leader that ensured the widespread diffusion of the product[165]. Fujitsu was better able to allocate sufficient resources to this project and to give it sufficient momentum to succeed. Such was the success of this venture that ICL and Fujitsu formed a joint 'TeamWare' operation to address the expanding groupware market at present dominated by 'Lotus Notes', a product now within the IBM group of companies. Fujitsu is marketing TeamWare in Japan and the US, while ICL markets the product in Europe. The continued success of this product has lead to TeamWare now being ranked third of all groupware products world-wide[166].

Common issues with joint product development

In both these joint projects and others, there were a number of issues that had to be

---

[161] Interview with Kitazato, 14/3/96.

[162] Company reports.

[163] Interview with Aida, 14/3/96.

[164] Interview with Yurino, 14/3/96.

[165] Interview with Kitazato, 14/3/96.

[166] Lotus Notes is at number one, with Novell at number two (Data from Fujitsu sources, 1996).

resolved to allow the smooth functioning of the projects. These were easily identified, but it was a much bigger problem finding ways to 'solve' them:-

> The major obstacle is the 'not-invented-here', or 'NIH' syndrome. Fujitsu has NIH syndrome, ICL has NIH syndrome. If you allow this to dominate then the project will fail. In some of the projects the NIH syndrome was very strong. In the case of TeamWare and TeamPoS, the [project] leaders took a very strong approach, and were determined to achieve some form of synergy between the groups. It comes down to the leader being able to guide the team towards a common objective[167].

The management of the joint projects was no simple task and was not achieved without a great deal of patience of the part of both sides. Referring back to the early co-operation between ICL and Fujitsu on PoS development in the mid-1990s, one ICL manager summed up the situation as follows:-

> In 1985, it was extraordinarily difficult with the PoS project. Now, it is merely difficult! The reason for the difficulties is that often a Western approach to dealing with complex issues is to be terribly instinctive, to synthesise from a whole series of issues in your head down to a conclusion quickly, and say 'This is the thing to do'. Japanese people tend not to behave like that at all. They are very meticulous. They record everything very carefully. They build-up from the bottom rather than coming down from the top. So in the early stages of the project, when we say 'It's obvious that this is the right thing to do, isn't it?', the Japanese will respond with blank looks and say 'Why is it obvious?'. We'll tend to use instinctive arguments that have fuzzy edges, which Fujitsu and the Japanese in general find extremely hard to deal with. [..] Put [Japanese and Westerners] together on a project and you will have in-built bumps and crashes. [The Japanese approach to decision making] is such that they are often very slow in coming to a decision, but by the time they do, they know exactly what it is, and they have a strong sense of consensus. But in a fast moving world, by the time they've done that, they're wrong anyway because the world has changed![168]

Formation of alliances

The acquisition of ICL by Fujitsu provided an assurance of continuity of ownership and allowed ICL to consolidate its position in the IT market through a series of its own acquisitions (See Exhibit 6.7).

Year	Target	Product/service	Country
1990	Databolin Information Systems	Software	Sweden

[167] Interview with Kitazato, 14/3/96.

[168] Interview with Davison, 28/2/96.

1991	Nokia Data	PC manufacturing, distribution, software.	Finland
1991	Bell Atlantic Customer Services International (50% share)	Computer service operations	US parent with European operations
1992	Technology	PC distribution	UK
1993	Softbank	Financial sector software	Poland
1995	Aquarius Robotron Systems	PC supplier	Germany

Exhibit 6.7 Key acquisitions by ICL 1990-1995
Source: Data drawn from FT Profile and Reuter Business Briefing

These acquisitions have provided ICL with increasing strengths in client-server related systems and in particular, PC production and distribution, software and customer support. In addition, between 1990 and 1995 ICL set in operation some 40 'major collaborations', some with competitors, to bring products and services to the market as quickly as possible[169].

Separation of hardware, software and services.

In line with the wider trend within the IT industry, ICL and Fujitsu are facing a gradual shift in the most profitable areas of their business from hardware to software, or more broadly, from devices to content and services. For Fujitsu, being a company that has built its strengths predominantly on technology, this will be no easy transformation to make. However, in the fast moving markets of small computers, Fujitsu does have one distinct advantage over some of its competitors: its size. The margins on the production of PCs is becoming ever smaller. It is only companies that can operate on a global scale that are able to gain sufficient economies of scale to allow them to maintain profitability[170]. Following the acquisition, Fujitsu and ICL began jointly branding their volume products (i.e., PCs and network servers). While some saw this as an example of the beginning of Fujitsu eroding ICL's name, this was not the case, according to a Fujitsu director:-

> The joint Fujitsu ICL logo was the idea of ICL, not Fujitsu! We [Fujitsu] agreed to this, and that become one of the ways in which we brought the companies closer together, [..] but it really was ICL

169 *Chief Executive*, January 1995.

170 Interview with Horne, 20/2/96.

who wanted the joint name[171] .

In terms of the shift from hardware to software, the situation is somewhat different for ICL than for Fujitsu. The management of ICL have been talking about transforming ICL into a systems and services business for a number of years[172] and a number of steps have been taken to ensure that this goal will be achieved. ICL has been moving though a series of stages moving the company far away from the mainframe, product-based 'old ICL'. These stages have been a shift to UNIX-based machines in the 1980s, shifting emphasis towards open systems hardware and then on to custom software to solve the needs of customers[173]. By promoting themselves as an IT services company, ICL was able to gain custom from established software giants such as Microsoft for the provision of their 'customer service needs'[174]. There has been a gradual process of consolidating hardware operations (as can be seen in the acquisitions made by ICL) while at the same time drawing a dividing line between the hardware side and the systems and services side (See Exhibit 6.8).

Systems and services	
ICL Retail	Retail IT solutions (services, hardware, software, systems management).
ICL Financial services	Systems and services to financial sector
ICL Enterprises	Systems and services to central and local government, utilities etc.
ICL Sorbus	Systems and service consultancy
CFM	Outsourcing business, facilities management
Technology plc	Provision of mulitvendor hardware and software products
High Performance	Large computer systems including mainframes
TeamWare Group	Groupware
Hardware	
Volume products	Assembly of PCs and servers (now managed by Fujitsu)

[171] Interview with Kitazato 14/3/96. Fujitsu have since taken over the managing of ICL's Volume Products division, and the products now carry the Fujitsu name. This has allowed ICL to focus on services and software, while Fujitsu takes over the hardware.

[172] Jebb (1996).

[173] *Upside*, January 1995.

[174] *The Economist*, 13/8/94.

D2D	Contract manufacturing (awaiting a buyer at time of writing)

Exhibit 6.8 ICL's spread of interests
Source: Company reports and Jebb (1996)

In 1996, Fujitsu announced that the volume products operations of ICL would be merged with those of Fujitsu. The aim was to aid the achievement of 'critical mass' in the highly competitive market for PCs and network servers. Fujitsu's volume products operations were turning-out 1.5 million units per year as compared with 500,000 from ICL.

The combining of volume products allowed the merged ICL and Fujitsu operations to achieve the 'global volume' necessary to maintain any profitability in the markets for open system based hardware. It has also been announced that the contract electronics manufacturing operations of ICL, D2D (for 'Design-to-Distribution') will be spun-off as soon as a suitable buyer can be found[175]. This will leave ICL operating largely as an IT systems and services firm within the Fujitsu group of companies. Fujitsu, being company whose operations are focused on technology, will absorb much of the hardware side of ICL. The fact that ICL has manufacturing plants located in Europe is important for Fujitsu:-

> The high valuation of the Yen has meant that we must manufacture close to the market. As long as the market exists, we must have manufacturing close to that market[176].

In order to be able to manufacture close to major markets, Fujitsu and ICL have also set up a joint venture to sell jointly branded PCs in the Asian markets.

> [For Fujitsu] the Japanese and Asian markets are still very much hardware oriented, whereas in the US and Europe, markets are split between services and systems integration. Fujitsu has learned from ICL, but will do more so in the future, as more attention begins to be focused upon services, systems integration and outsourcing[177].

Both ICL and Fujitsu have formed groups to focus their efforts on finding ways of deriving added value from the converging fields that will form the digital industry, and more specifically, the non-hardware side. Each company has approached this task from

---

[175] Anonymous D2D source.

[176] Interview with Yurino, 14/3/96.

[177] Interview with Aida, 14/3/96.

different standpoints. For ICL, the approach taken is one of the delivery of information related services:-

> If ICL haven't been able to add 5% to its net margins [over the next three years] by delivering information, alternative methods of communicating and just-in-time delivery of educational and training material [..] then we will have failed[178].

Such information-related service represent for ICL a number of areas, which include, electronic commerce, the changing world of broadcasting and electronic publishing. For Fujitsu, one way it is seeking to operate in the new competitive environment is through the hardware and software required by networked small computers. In other words, they aim to retain their strengths in *devices*, but shift emphasis pumping more resources into *distribution* and *content*. By approaching the future in this way, Fujitsu is able to extend its core strengths, while utilising the strengths of its alliance partners where it has weaknesses.

> [Fujitsu] aims to get as much as 30% of its revenues from Internet related services, software and hardware. [Fujitsu] is ploughing nearly half of the company's $3.6 billion R&D budget into Internet and multimedia related products and services. [..] Alliances are now easing Fujitsu's entry into the US software market as well. [..] 'We can't compete on a global basis in software without making use of top technical people in the US' says Tatsuzumi Furukawa [Fujitsu's board director charged with the firm's multi-media strategy][179].

Fujitsu's products focusing on the Internet, and the way in which it is building on the firm's core strengths and those of alliance partners are shown in Exhibit 6.9.

Software	Hardware	Services
• Jasmine/ODB II - an object oriented database ideally suited to Internet-based usage. • TeamWare - Developed in conjunction with ICL, from ICL's acquisition of Nokia Data.	• PCs - With ICL's capacity, Fujitsu has been able to grow in this area. • Plasma displays - Fujitsu has gained strong competence in this area. • ATM switches - Fujitsu has strong competence in this	• Worldsaway - an on-line chat service. • NiftyServe - Japan's oldest on-line service provider, which is still growing rapidly. • InfoWeb - one of Japan's growing Internet access providers.

[178] Interview with Davison, 28/2/96.

[179] *Business Week*, 18/3/96.

• Atlas - translation software, for translating between English and Japanese over networks.	area.	

Exhibit 6.9 Fujitsu's Internet products and services
Source: *Business Week* 18/3/96 and Fujitsu related WWW sites.

One problem that Fujitsu faces, in common with many IT firms trying to map a path into the future, is in knowing which emerging technologies to invest in. One solution is to apply a 'grape-shot' approach:-

> It is so difficult knowing which area will come up. So we must invest in as many areas as possible. The problem we face is that the management characteristics of [content] firms is totally different from manufacturing firms[180].

Fujitsu and ICL are thus approaching the digital industry in different ways. Fujitsu, being fundamentally a technology based firm tends to think in terms of: "How do you apply technology to the world markets"[181]. ICL has already achieved this break away from the 'technology product' focused view of the world (something it has been attempting since the early 1980s) and now views the role they can play in the new competitive environment as one of the delivery of information:-

> The technology itself is obviously critical, for if it's not there, you can't do anything. Once it is there, it's almost a commodity. It's then what you do with it that counts[182].

Fujitsu and ICL are finding common ground for joint projects. One example of this can be seen in the use of Fujitsu's object-oriented database software, Jasmine, or ODB-II. ODB-II was launched in Japan in 1994 after eight years of development, and ICL is taking this product and customising it for local needs of the European markets.

An application area that ICL is working on is that of the Internet. ICL's 'Publishing Content Store' helps companies manage information delivery over the Internet by managing changes in information, controlling access and charging users. ICL is also forming links with the BBC which is also providing Fujitsu with access to a huge content

[180] Interview with Yurino, 14/3/96.

[181] Interview with Davison, 28/2/96.

[182] Interview with Davison, 28/2/96.

and distribution resource.

> Content will become a very big business for Fujitsu. The BBC has a huge asset of content, so we want to make a business with them to transport and transfer this content[183].

Performance

ICL

Throughout the 1980s, ICL remained the only "consistently profitable broad-based computer manufacturer head-quartered in Europe"[184] (See Exhibit 6.10). Into the 1990's profits started falling, but this reflected a general squeeze put on computer manufacturers as the industry trend shifts towards low-cost, low-margin commodity systems.

Year	IBM	DEC	SNI	Unisys	Bull	Olivetti	ICL
1991	(1894)	(408)	(267)	(922)	(387)	(245)	62
1992	(3288)	(1851)	(217)	239	(590)	(349)	39
1993	(5635)	(166)	(168)	374	(591)	(196)	23
1994	2000	1427	(138)	67	(255)	(278)	28
1995	4200	81	11	(413)	0	(420)	(31)/(152)[185]
Total	**(4347)**	**(3771)**	**(779)**	**(655)**	**(1793)**	**(1488)**	**(31)**

( ) represents minus

Exhibit 6.10 Profitability of major computer manufacturers in US$ millions
Source: Fujitsu internal document

The cost of restructuring to allow ICL to compete in this increasingly competitive environment resulted in ICL being pushed into the red in 1995, the first time since 1981 (See Exhibit 6.11). This dramatic plunge was caused by the continued cutting of margins, but was swollen by the cost of redundancy payments and office closures as the UK firm sought to restructure in the face of fierce competition. Fujitsu, who had already injected £100 million into the UK subsidiary in 1993 again came to the rescue by underwriting a £200 million rights issue. At the same time, ICL announced the merger of its volume product operations, and the desire for a partner for contract electronics manufacturing

---

[183] Interview with Yurino, 14/3/96.

[184] *Financial Times*, 16/3/94.

[185] £152 million represents the exceptional items incurred by restructuring.

operations, D2D, to be found.

The planned flotation of ICL has been postponed, though it is still hoped to be "sooner rather than later" according to a company spokesman[186].

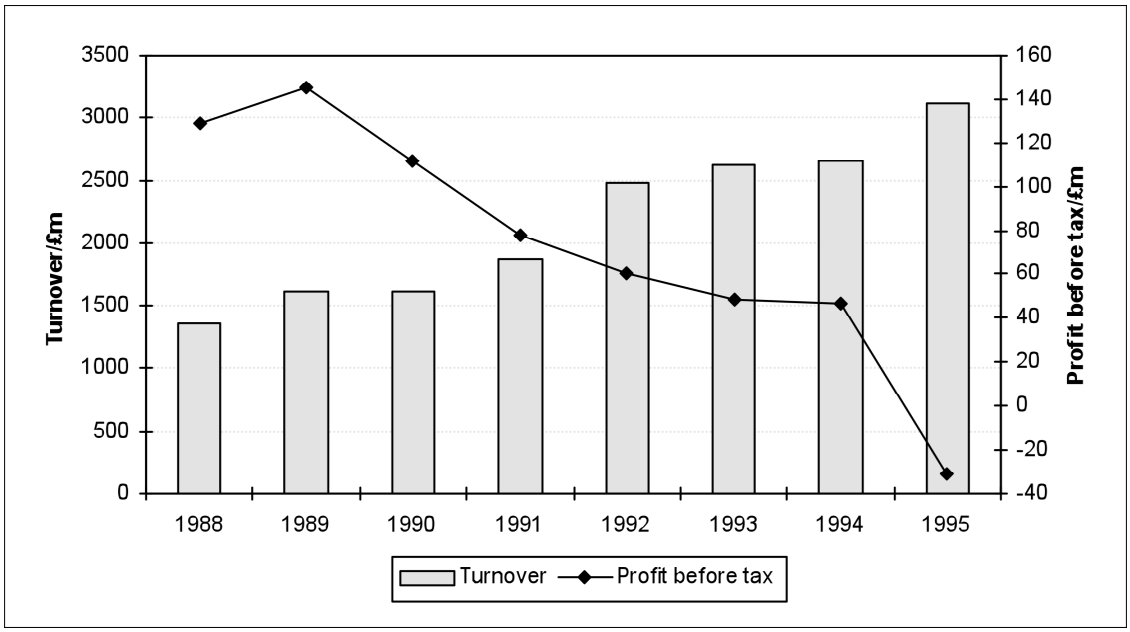


Exhibit 6.11 ICL turnover and profit before tax

Source: Company reports

Note: 1995 profit figures exclude the £152 million exceptional charge for the cost of office closures and redundancy payments as the firm sought to rationalise its operations.

Fujitsu

As the after-shock from the bursting of the bubble economy caught up with Fujitsu and profits collapsed (See Exhibit 6.12). Fujitsu did not suffer as badly as its arch-rival IBM, but was still forced to restructure in the face of a harsh competitive environment caused by the delayed recovery of the Japanese economy, the rapid appreciation of the Yen and the depressed state of the US mainframe market[187]. Fujitsu was in some ways cushioned from the impact of the shift away from mainframes towards open systems based computing that wrought such havoc with IBM by having major interests outside computing, and in particular telecommunications[188]. Though having to face stiff

[186] *Lloyds List*, 9/3/96.

[187] *Financial Times*, 10/11/93.

[188] For example, the European telecommunications market was being liberalised by the mandatory elimination of

competition from European telecommunications equipment suppliers, non-European companies such as AT&T, Nortel and Fujitsu hoped still to be able to benefit from this investment boom.

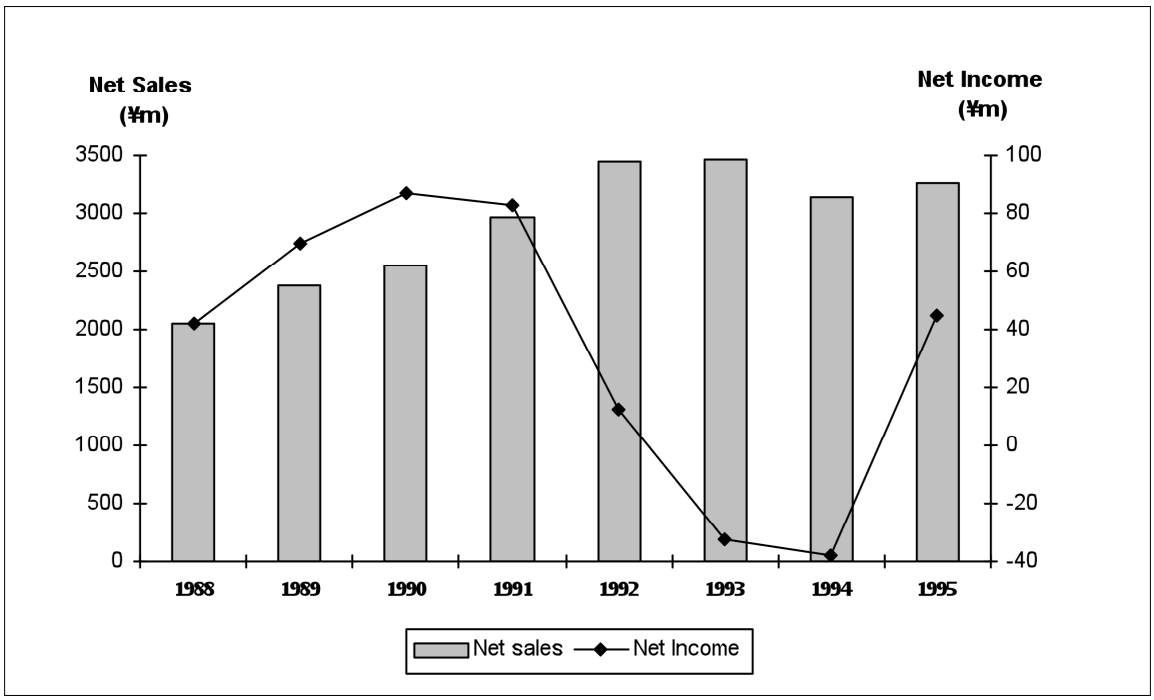


Exhibit 6.12 Fujitsu net sales and net income 1988 - 1995
Source: Company reports

In 1993, Fujitsu was forced to cut R&D spending and capital expenditure, as well as lowering the numbering of employees by 6000 over a two year period through natural wastage[189]. The year's loss represented the first time that Fujitsu had gone into the red since 1949[190].

Closing comments

ICL has played a strong role in changing Fujitsu to face the new competitive environment. In 1993, things were looking bleak for Fujitsu, who had lost money for the first time since 1949. Yet the ongoing recession in Japan that was having such an effect on Fujitsu's revenue was also in a way providing an opportunity. The shift towards open

monopolies, the consequent increased level of interest from abroad and the consequent requirements for upgrading.

[189] *Financial Times*, 8/9/93.

[190] *Financial Times*, 4/6/93.

systems based computing had been slow in reaching Japan, and was being held up in part by the lack of desire on the part of Japanese companies to spend money on renewing their IT systems in a depressed economy. This gave Fujitsu a 'breathing space' to restructure and rationalise in order to compete more effectively in the open-systems-based computer industry. ICL was playing a crucial role in that process, as was trumpeted in the press at that time:-

> Given the tenfold differences in their revenues, it would be ridiculous to talk of 'reverse take-overs', but if Fujitsu looks to its UK subsidiary for guidance through the [open-systems based] computing jungle, then ICL's influence should grow out of all proportion to its size[191].

It seems that ICL has been able to play an important role in helping Fujitsu move from the 'old' computer industry, based on selling a relatively small number of large, proprietary computing systems to domestic corporate clients, to the open-systems based 'new' computer industry in which high volumes of small computers are sold on a global basis. ICL, at the same time, has been able to continue its reformation into the services and systems integration firm it has been attempting to become since the early 1980s. As one ICL manager described, for IT companies in the open-systems based computing environment, and the subsequent predicted shift into the digital industry, "knowing which business to give up is the most important thing"[192]. In a way, ICL has been where Fujitsu is now, and has consequently been able to offer outside advice from an internal position:-

> With Fujitsu and ICL working closely together, ICL's input can help speed up Fujitsu's thinking. That is something very important for ICL. When Peter Bonfield[193] talks to the management of Fujitsu, his view is sometimes very provocative, but people think: 'What he says now may be true in Japan in two years from now'. People know that, so even if Fujitsu management are not comfortable with the ideas presented by ICL, they know that it will happen eventually, so Fujitsu respect and appreciate the input from ICL[194].

---

191 *Financial Times*, 4/6/93

192 Interview with Davison, 28/2/96.

193 CEO of ICL at the time of the interview. At the time of writing, Peter Bonfield had been made the chairmen of British Telecom (BT), whilst retaining a position within ICL as non-executive chairmen. His move to BT was put in a favourable light by Fujitsu: "In some ways it was very good for ICL, as he [Bonfield] had been with ICL for 13 years. That is too long to keep one management team. So this has been viewed as a very positive development by some middle management" (Interview with Yurino, 14/3/96).

194 Interview with Kitazato, 14/3/96.

The fundamental difference in culture that differentiates the two companies has been managed so as to work in favour of the two organisations:-

> Fujitsu people think in terms of technologies. ICL people think in terms of the market and the customer, and change corporate style to meet the change of market and customer. But Fujitsu's way is to start thinking from the product or technology, and to try and adapt that technology or product to the market. So sometimes we have become arrogant, thinking that as we have a good technology, we must push this technology to the market and the customer. That was OK in Japan, because Fujitsu had a very big power influence over the customer. [..] but in the global market, this is not acceptable. You have to be more flexible and you have to structure yourself to meet the needs of the market. Then you have a better sense of the capabilities you need to catch the changing direction of the market[195].

Fujitsu is reforming itself, and is able to draw upon the resources of ICL to help it do that. In some ways, ICL has already been along the road that Fujitsu is now travelling. ICL has been moving doggedly along the path of transformation from a highly vertically integrated product based company to a services and systems integration company, whose focus is now the distribution of information.

[195] Interview with Kitazato, 11/1/95.

Chapter 7 Case Study B: MELCO-Apricot

Chapter overview

In 1990, the Mitsubishi Electric Corporation (MELCO), one of Japan's leading producers of general electrical machinery, acquired 100% ownership of the hardware division of Apricot Computers, a UK-based provider of PC hardware, software and related services.

MELCO had struggled in its attempts to produce a range of PCs to allow the firm to compete in the international markets for open-systems based computing. Despite beating IBM to become the first company to produce a 16-bit PC in 1981, MELCO had found its skills in heavy electrical machinery and industrial products predominately for sales in the domestic Japanese market had not provided it with sufficient flexibility to be able to compete in the dynamic, international markets for open systems based computers.

Apricot, despite having a strong services and software business unit was finding its profits held down by the hardware side towards the end of the 1980s. It was becoming clear to the management of the UK firm that in order to compete in the international markets for open-systems based hardware, high volume and international manufacturing capacity were needed. Apricot was unable to find the financial backing to develop such capacity. In 1990, Apricot announced that it was seeking a buyer for its hardware division. Interest was shown from a wide range of bidders, but it was MELCO which was able to provide the best terms for Apricot, and ownership was acquired in May of 1990 for a cost of £39 million. Apricot has since been integrated into MELCO as the Mitsubishi Electric PC Division, though the Apricot brand name has been kept for PCs and servers.

MELCO

The Mitsubishi Electric Corporation (MELCO) was founded in 1921 and is now Japan's fourth largest manufacturer of general electric machinery after Hitachi, NEC and Toshiba[196]. 1995's net sales were over US$36 billion derived from a product range which is divided into four main areas:- information, telecommunications and electronic devices; heavy machinery; industrial products and automotive equipment; consumer and other products[197] (Exhibit 7.1 shows the relative split of sales derived from each of the four product groups).

	1991	1992	1993	1994	1995
Consumer and Other Products	*30*	*31*	*31*	*28*	*28*
Industrial Products and Automation Equipment	*18*	*17*	*16*	*16*	*16*
Heavy Machinery	*20*	*20*	*23*	*25*	*24*
Information, Telecommunications and Electronic Systems and Devices	*32*	*32*	*30*	*31*	*32*
Total	**100**	**100**	**100**	**100**	**100**

Exhibit 7.1 MELCO's main product areas by percentage sales, and changes 1991-1995
Source: MELCO Company Reports

MELCO is located in more than thirty countries world-wide and has over 100 affiliated companies. Despite having such a wide international presence, MELCO still consistently derives almost 80% of its sales from the domestic Japanese market (See Exhibit 7.2). The company is one of the four largest members of the Mitsubishi Group of companies along with the Tokyo Mitsubishi Bank, Mitsubishi Corporation and Mitsubishi Heavy Industries.

	1991	1992	1993	1994	1995

[196] *Asahi* (1995).

[197] Details of the full product range are given in Appendix III.

Japan	*78*	*79*	*78*	*79*	*77*
Europe	*5*	*5*	*5*	*4*	*9*
North America	*10*	*9*	*9*	*8*	*8*
Asia (except Japan)	*5*	*6*	*7*	*7*	*4*
Others	*1*	*1*	*2*	*2*	*2*
Total	**100**	**100**	**100**	**100**	**100**

Exhibit 7.2 MELCO's percentage sales by region, and changes 1991-1995
Source: MELCO Company Reports and Extel data

MELCO's entry into computing[198]

MELCO had entered computing in the 1960s following the signing of a MITI co-ordinated deal to allow Japanese firms access to IBM's basic computer technology patents in return for IBM being allowed access to the Japanese markets. MELCO was one of 7 firms who quickly took up the opportunity that this technology agreement offered[199].

In the early stages of MELCO's development of computing competence, this area of interest never represented more than a small percentage of total sales. The majority of sales were still being derived from the core heavy electrical machinery business. To enhance the ability of MELCO to derive value from this growing area, MELCO formed an alliance with TRW in the US. When TRW withdrew from this area in the 1970s, MELCO responded by forming alliances with Xerox and Univac. Univac had already formed a joint venture with Oki Electric in Japan. Oki-Univac, as the joint venture was known, subcontracted part of the computer and peripheral production to MELCO; in return, MELCO sold imported Univac machines, as well as machines from the Oki-Univac partnership. MELCO had limited success in the markets for large computers, but focused efforts on the production of smaller machines and peripherals[200].

---

198 This section is drawn from Anchordoguy (1989) and Fransman (1990).

199 The other 6 being NEC, Fujitsu, Hitachi, Matsushita, Toshiba and Oki.

200 This was partly due to the way MITI had sought to 'rationalise' the Japanese computer industry in order to develop an effective response to IBM's domination. Fujitsu, NEC and Hitachi were encouraged to focus on mainframes, while Toshiba, Oki and MELCO were pushed to focus emphasis upon smaller computers and peripherals.

MELCO's entry into the PC market

In January of 1981, MELCO narrowly beat IBM and Fujitsu to become the first computer company in the world to produce a 16-bit PC[201]. However, this early product, the 'Multi 16', suffered from a number of design faults[202]. These faults were corrected, and MELCO PCs went on to do well in the domestic Japanese market. By acting as an OEM supplier for the UNISYS computer company in the United States, MELCO managed to capture 70% of Japanese PC exports[203]. Unfortunately, the relationship with UNISYS did not last, as the Japanese company found its prices being under-cut by the emerging Taiwanese computer manufacturers such as Mitac and Acer[204]. Eventually, UNISYS switched its OEM sourcing to the lower-cost Taiwanese manufacturers. MELCO then attempted to continue to sell its PCs under the Mitsubishi Electric brand name in the US, but without great success. An additional problem had emerged with MELCO PCs. MELCO had opted for the CP/M operating system for their early machines, rather than the Microsoft Disc Operating System (MS-DOS) selected by IBM for its PCs. As MS-DOS went on to become the *de facto* industry standard for early PCs world-wide, the early MELCO PCs were facing a shrinking market.

MELCO's problems with PCs

Aside from the initial selection of the 'wrong' operating system[205], MELCO's problems in the PC market stemmed from two major factors. Firstly, while the company's main rivals in the PC field at that time, IBM and Compaq, were acting on a global scale and were thus able to reap the cost benefits of international component procurement, MELCO was not. The Japanese company continued to procure components almost exclusively from within Japan and in smaller quantities than their main rivals[206]. Consequently

---

[201] MELCO PC History, 1991.

[202] Interview with Daisuke Goto, 15/3/96.

[203] Internal MELCO document.

[204] Interview with Takashi Goto, 15/3/96.

[205] In the early stages of growth of the PC market, it was by no means clear which products would emerge as standards. It was only really by chance that IBM had not opted for CP/M for their original PC (Cringely, 1992). MELCO had in a sense just been unlucky in backing the wrong operating system.

[206] Interview with Daisuke Goto, 15/3/96.

MELCO's PC prices were less competitive in international markets.

Secondly, MELCO, being "basically a technology company"[207] was less proficient than its main rivals at overseas marketing. MELCO's core business for much of its 75 year history had been based in the fields of heavy electrical machinery and industrial equipment. The relationship that MELCO had developed with its customers in these fields tended to be very different to those needed within the PC market. MELCO's own-branded PC business continued to "fail everywhere"[208] as the division responsible for developing PCs had numerous difficulties getting the right product to market at the right time[209].

MELCO's return to the PC market

IBM's change of strategy

For MELCO in Japan, one of the biggest groups of customers for its computers were the other members of the Mitsubishi *keiretsu.* As MELCO's computer competences lay largely in the production of small computers and peripherals, MELCO was unable to provide the *keiretsu* customers with a full range of computer systems and services. In particular, as MELCO had largely withdrawn from the production of their own main-frame computers, focusing instead on providing components for joint production or the importation of non-Japanese machines, they had no choice but to recommend an alternative supplier to Mitsubishi *keiretsu* members. MELCO decided to push IBM computers as the best option for Mitsubishi companies so as not to give MELCO's domestic rivals an opportunity to get a foot inside the Mitsubishi camp[210]. MELCO continued to provide all other smaller computers and peripherals, such as monitors and terminals, to Mitsubishi companies.

When IBM released its PS/2 series of PCs in 1987 based in micro-channel architecture

---

[207] Interview with Daisuke Goto, 15/3/96.

[208] Interview with Horne, 20/2/96.

[209] Reviews of MELCO PCs from around this time described the machines as: ".. slow, awkward and expensive" (*Which Computer*, July, 1988) and ".. obsolete and too expensive." (*Wall Street Journal*, 17/4/86).

[210] Interview with Daisuke Goto, 1996.

(MCA)[211] which allowed a high degree of inter-connectability between micro-, mini- and mainframe computers within the IBM range, there was a strong incentive for MELCO to have access to such technology internally. The PS/2 series of computers was IBM's way of re-gaining the market share it was losing to the 'clone' producers by redefining the industry standard technology[212]. Access to MCA technology, it was hoped, would not only provide MELCO with the ability to catch the wave of the next range of PC technology, but also to produce small computers that would be connectable with the IBM machines that they had encouraged other Mitsubishi companies to buy.

Changes in the Japanese PC market

At the end of the 1980s and into the early 1990s, there were those within MELCO who realised that the Japanese PC market, presently dominated by NEC's proprietary systems, would undergo a dramatic change once computers based around internationally common, open standards began to reach Japan[213].

> It was actually not until 1994 that the Japanese market started to really open up and move away from the NEC/AX consortium. But [MELCO] knew this was going to happen[214].

Vertical integration

An additional issue relating to the PC market was the missed opportunities that stemmed from MELCO being a large semiconductor producer (ranked 9th in the world by sales[215]), without being a high volume PC producer[216]. More vertically integrated domestic rivals in the PC market, such as NEC and Fujitsu, were able to internally source DRAM chips and

---

[211] IBM announced its new series of machines based on Micro Channel Architecture in April 1987. The machines were more powerful and faster than the previous IBM PCs, but the MCA bus was not compatible with add-in devices for the PC-AT series that IBM had produced and that clone makers were now becoming dominant in selling (Chposky & Leonis, 1998). IBM saw the PS/2, coupled with a new operating system, OS/2, as a way of regaining PC market share gained by the clone makers. This was not to be the case, as customers had grown accustomed to the freedom of being able to choose between a wide range of vendors for computer hardware peripherals, and were not interested in having to scrap these and invest in new technology, albeit one that offered improved performance.

[212] Chposky & Leonis, (1989).

[213] In March 1991, a group of PC manufacturing companies, under the guidance of IBM Japan set up the PC Open Architecture Development Group. The aim of this group was to promote a bilingual operating system which could be used with IBM compatible machines and was called DOS/V. This, it was hoped, would open up the Japanese market and break the hold that NEC and its proprietary 'mini-open' system had on over half of the Japanese PCs (*Reuter News Service*, 11/3/91). See Fransman (1995, Chapter 4) for further information on the evolution of the Japanese PC market.

[214] Interview with Horne, 20/2/96.

[215] *Asahi* (1995).

[216] Interview with Daisuke Goto, 15/3/96..

thus benefit from improved profit margins for their PCs. MELCO was still selling-on the majority of their memory chips to assemblers who then added their own margin and increased their own profitability[217].

Wider changes within MELCO

The emergence and rapid diffusion in Europe and the US of open-systems based computing and the widespread realisation that this technology would soon be impacting upon the Japanese IT industry acted as an indicator to wider management issues which MELCO needed to address if the corporation was to become a truly global company. MELCO was consistently deriving over 75% of its sales from the domestic market. The company needed to acquire skills in areas such as international marketing if it was ever to be able to compete in what was becoming a global business. This view was summed up by one Japanese manager:-

> [..] the PC business is getting very open - MELCO wants to have world-wide activities in this business. So, from a management point of view, MELCO *wants* to be a transnational company, and from a business point of view - especially the PC business, it *must* be a transnational company[218].

MELCO had gained a reputation for a wide range of technological competences held within an organisational structure which had been described as a "slumbering mess"[219]. The problems faced by MELCO were summed up by one MELCO manager:-

> [MELCO has always found it] difficult to move into new business areas - easier to stay with current ones. The senior management are always looking to the future of MELCO. They are looking for changes in the technology or the products, but it takes time to change everything.[220].

MELCO, being a part of the giant Mitsubishi *keiretsu*, had been able for most of its history to draw on the strengths that exist among the 29 core members of the Mitsubishi group and their affiliates[221]. In the past, these connections, coupled with competences built-up through Japanese Government supported collaborative R&D projects and loose

---

[217] A similar motive was part of the reason for Korea's Samsung acquiring 40% of AST Research Incorporated in the US.

[218] Interview with Sawai, 20/2/96.

[219] *The Economist*, 19/2/94.

[220] Interview with Sawai, 20/2/96.

[221] See Ohsono (1995) for details of MELCO's *keiretsu* connections.

collaborations with non-Japanese companies[222] have proved to be sufficient to allow MELCO to respond to changes in the competitive environment for computers, but never to compete in the same league as rivals such as NEC, Fujitsu and Hitachi[223].

The management of MELCO were aware that the move towards open systems-based computing was the start of a wider series of changes in the industry (as highlighted in Chapter 2). Such a highly uncertain environment would almost certainly require resources in areas that MELCO lacked. Consequently, MELCO would need to be much more flexible than it had shown itself to be in the past. A key skill that would be required in the changing competitive environment would be the ability to work closely with external, and particularly non-Japanese firms.

Such thinking did not come easily to some within MELCO, where the development of a response to technological discontinuities in the past had stemmed from an attitude summed up as:-

> We did it on our own before. We can do it again. MELCO always wants to do everything by itself![224].

Strategy to respond

Thus, towards the end of the 1980s, MELCO management realised that they needed two things. Firstly, within the Information and Communication Systems Group, there was a need to gain the resources which would allow them to develop competence in open-systems computing. It was not a matter of missing an opportunity to sell a particular type of small computer, but rather that these small computers were redefining the entire computer industry, and if MELCO wished to remain competitive in computing, it needed to have competences in this area.

Secondly, the international and dynamic nature of the emerging open systems based computing and MELCO's failed attempts to enter the international market for PCs

---

222 MELCO had gained much of its early computer technology from collaborations with first TRW and then Sperry in the US (Anchordoguy, 1989).

223 *Computergram International*, 27/8/91.

224 Interview with Daisuke Goto, 15/3/96.

pointed to wider changes that were needed within the organisation of MELCO. As the changes resulting from the predicted formation of the digital industry began to impact upon MELCO, the uncertain environment that this convergence presented pointed to the fact that a high degree of organisational flexibility would be needed[225]. As such, the ability to form, and make effective use of alliances would be of crucial importance. In the past, MELCO had focused heavily on the provision of technology. If MELCO lacked a specific technology, it would go outside to find it, pulling on the resources of the other Mitsubishi *keiretsu* members. With matters of business, such as marketing and forming alliance with other companies, this had been largely left to another member of the Mitsubishi *keiretsu*, the Mitsubishi Corporation[226]. In the fast moving and international environment of open-systems computing, such reliance on a separate company to deal with marketing and alliance formation was inappropriate[227]. MELCO needed to develop sufficient flexibility and openness in outlook to allow it to seek out partners on its own.

MELCO thus needed to find a partner to provide the required technology that would allow it not only to re-enter the PC market, but to steal the technological lead on its Japanese competitors by having access to MCA technology that would enable it to produce machines compatible with IBM's predicted new industry standard. In addition, MELCO realised that it needed to become more flexible and able to respond more rapidly to the dynamic environment that the 'new' computer industry presented. This was the situation facing MELCO as the 1980s drew to a close.

Apricot

Apricot, initially trading as Applied Computer Techniques (ACT), was founded in 1965 by Roger Foster as a computer services provider. The company went public in 1979 and

---

225 Interview with Daisuke Goto, 15/3/96.

226 The relationship between MELCO and the Mitsubishi Corporation was described by one MELCO manager as follows:- "The Mitsubishi Corporation is a trading company. At business management issues, Mitsubishi Corporation is very good - merging companies, making acquisitions and investing in companies. MELCO is a technology company and did not want to invest in other companies. They simply wanted to sell their own technology products. They wanted to keep the technology and sell on the products. For the new technology areas, MELCO has only a part of the required technologies. To get the remaining technologies, they *must* invest in other companies and form technology alliances." (Interview with Sawai, 20/2/96).

227 Interview with Daisuke Goto, 15/3/96.

in 1981 began the import of a 16-bit PC, the 'Sirius I', from the US. This was the first of its kind to reach the European market and sold in sufficient quantities to convince ACT to set up its own PC manufacturing operation.

The initial range of 'Apricot' branded PCs sold well, but by 1986 a serious problem had emerged. Apricot PCs did not conform to IBM's PC-AT standard. As it became clear that maintaining a proprietary standard for Apricot machines would continue to damage sales, the decision was made in 1986 to redesign the PCs to allow compatibility with IBM machines, and in particular the predicted MCA-based machines which Apricot anticipated would become the prevailing design in the PC market[228]. The cost of this re-design resulted in a dramatic fall in profits (See Exhibit 7.3).

Trends in the PC hardware industry at that time indicated that only companies with an international presence were likely to survive[229]. By the late 1980s, companies in the UK computer industry who still only had a predominantly domestic market presence were facing problems.

> As a small company in the UK, as Apricot was, we could not afford the ongoing investment to become a world-wide manufacturer. If you hadn't become international by the early 1980s, it was too late to start off on that course. The investments were too large and the City wasn't interested[230].

For Apricot's hardware side to survive, it needed investment to allow it to develop international manufacturing capacity. The volume of PC production needed to allow the firm to become a major player in the international markets for PCs was around 1 million. In 1990, Apricot was selling just 40,000 units per year[231].

---

[228] Other manufacturers were less convinced of the ability of IBM to use MCA to change the direction of the PC market back in its favour (*Financial Times*, 12/4/90).

[229] The PC market had reached a stage of maturity that the margins on the products were razor thin, and for firms to make a profit, they needed to be either niche players, or to have sufficient global coverage to be able to reap the benefit of global procurement and other economies of scale (Interview with Horne, 20/2/96).

[230] Interview with Horne, 20/2/96.

[231] Roger Foster, chairman of Apricot, as reported in the *Financial Times* (12/4/90). This was, however, well under the capacity that Apricot was capable of producing (*Electronics Weekly*, 18/4/90).

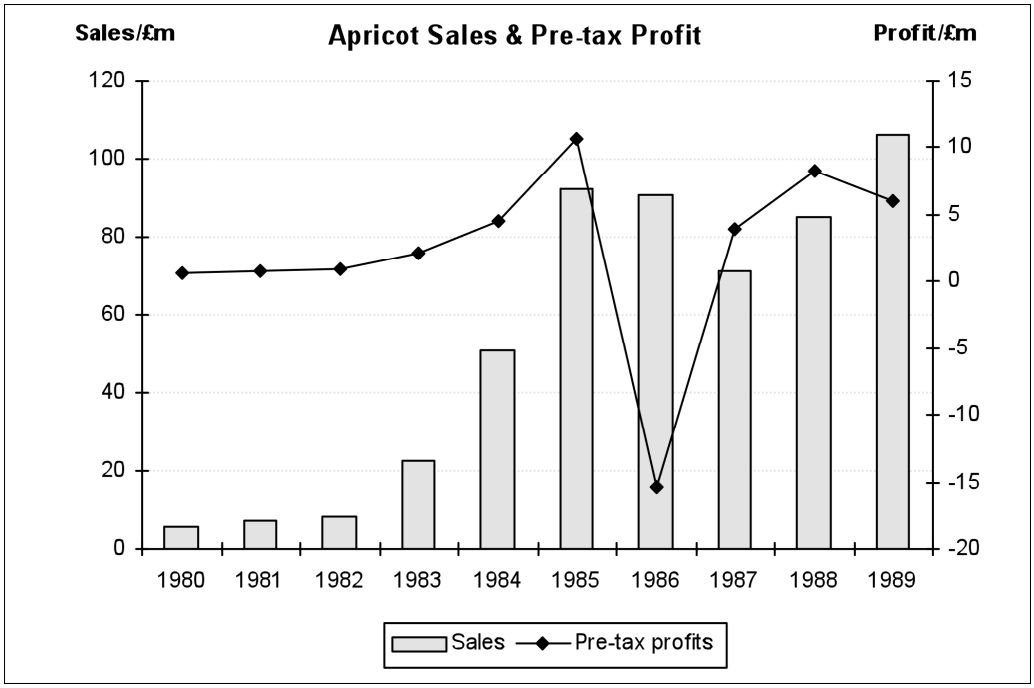


Exhibit 7.3 Apricot pre-acquisition sales and pre-tax profit
Source: Harvey-Jones, 1990.

Division of hardware, software and services.

Despite the company having a strong software and services business unit, the hardware side was holding down profits. Though possessing world class manufacturing capacity they lacked the international presence that would have allowed them to achieve 'critical mass'. It became clear to the management of Apricot that it would be better for the company as a whole if the hardware and software sides were separated. The decision was made in 1989[232] to change the way Apricot did business.

A number of acquisitions of computer service oriented companies had been made by Apricot, and it seemed to be an indicator to members of the hardware division as to the direction in which the future of the company lay. Of these, the 1989 acquisition of ITL seemed to point clearly to the future strategies of Apricot. ITL was formerly known as Computer Technology and had been the UK's oldest indigenous minicomputer producer. ITL's value to Apricot lay not in its hardware side, but in its software and services activities. Apricot was able to merge these non-hardware activities with its own to form a

[232] Before the visits, subsequent TV documentary, and well publicised advice by Sir John Harvey-Jones.

software and services unit that had potential sales of more than £80 million per year[233]. Having achieved this 'critical mass' on the services and software side, it was then possible for the hardware side to be spun off.

Those within the hardware side of the company were keener to stay with the production of PCs and servers. Peter Horne, the former head of R&D who went on to manage the hardware side of Apricot summed up the views of those working in the hardware side of Apricot. His goal was:-

> .. to help make it a success, because the hardware side of the business is what I'm most interested in. Less of the other people at Apricot at that time were[234].

In January 1990, Apricot announced that it was seeking a partner for its hardware division[235]. It soon became clear that a number of companies were interested in acquiring the division. These firms saw the potential advantage of having a PC manufacturing facility within the European Union when integrated into a wider international manufacturing network and consequently able to draw upon economies of scale in procurement and distribution. Apricot's technology was highly regarded within the industry, and it seemed clear to the potential buyers that all it lacked was the ability to raise sufficient capital to allow it to invest in building an international presence[236].

Having so much interest from around the world (four companies from the United States, two from Taiwan and two from Japan) put Apricot in a strong position when it came to dictating terms. The management of Apricot decided that it would be in the best interests of all concerned if the splitting off of the hardware division were to be carried out as quickly as possible. Apricot thus set a extremely tight time-frame of just three months for completion of the deal. Owing to the high level of competition for the ownership of the division, Apricot were able to bargain hard for a good sale price.

---

233 *Financial Times*, 12/4/90.

234 Interview with Horne, 20/2/96.

235 *Birmingham Post*, 18/4/90.

236 *Financial Times*, 12/4/90.

Acquisition

In May 1990, Apricot sold its manufacturing arm to Mitsubishi Electric UK Limited (a wholly owned subsidiary of the Mitsubishi Electric Corporation in Japan). The final price paid for the acquisition was £39m[237]. This gave the Japanese corporation not only the entire hardware R&D, manufacturing and administration facilities of Apricot in Birmingham, Scotland and those of its subsidiary in Australia, but also the right to use the 'Apricot' brand name. Use of the brand name was regarded as important, as MELCO were aware of the strength of the Apricot brand in the market for open systems hardware.

Peter Horne was to become Group Managing Director of Apricot Computers. The software and services side of Apricot was to revert to its old name of ACT. ACT would retain the right to resell and service Apricot machines and maintain links with Apricot's R&D operations[238].

Motives for the Acquisition

MELCO's motives for forming an alliance with, though not necessarily acquiring the hardware division of Apricot Computers Limited in the UK can be grouped as follows.

- *MELCO's need to move to open systems based computing*. There were specific factors relating to the problems faced by the Information and Communication Systems Group of MELCO in trying to produce an internationally competitive PC as the company headed into the 1990s. MELCO had tried, and failed, to produce and internationally market its own PC. The move towards open-systems based computing was continuing to increase in momentum and MELCO, like most other Japanese computer manufacturers saw the importance of having access to the resources in this area to allow it to develop the necessary competences. Apricot coming on the market at that time provided an ideal opportunity to internalise the required resources, and to combine these with MELCO's own resources (such as DRAM and monitor

[237] The audited net value of Apricot's hardware division was £16.4 million, which implied that MELCO was willing to pay £22.6 million to extend its influence in Europe as well as gain Apricot's MCA technology (*Financial Times*, 12/4/90).

[238] *Electronics Weekly*, 18/4/90.

production) to achieve 'critical mass' through vertical integration. Also, IBM's PS/2 was anticipated by some to become the new standard for PCs, and consequently MELCO wanted to attempt to leap ahead of the competition by investing in what it hoped would be the next generation of PC technology.

- *MELCO's need to become more 'open'*. There were factors which stemmed from the more general feeling within MELCO that the company could no longer draw upon sufficient resources internally to provide responses to the rapidly changing global markets for open systems based computing and the combined products derived from the converging technologies of computing, consumer electronics and communication. MELCO seemed well aware that being an internally focused organisation was inappropriate for competition in the fast moving and internationally focused markets for open systems based computing, and the subsequent changes in the competitive environment. As such, there were those within the firm who saw the need to form links with non-Japanese firms and to learn how to manage these alliances to the best advantage of MELCO.

Post-acquisition

Integration issues

Once the deal had been announced, there was anticipation, both internally and externally, as to how MELCO would manage the acquisition integration process. As it turned out, the Japanese corporation seemed to favour a process of maintaining structural integration[239]. MELCO was almost completely non-interventionist and managed the process by-and-large as a total 'hands-off' approach. In the words of Apricot's managing director, it was as if MELCO was saying:- "OK, you're part of us, now what do you want?".

While this may have been the best approach to take, it illustrated a degree of risk taken on the part of MELCO. Unlike Fujitsu and ICL, MELCO and Apricot had no relationship

[239] In summary, the spectrum of acquisition integration options varies from (1) assimilation, where one party adopts the identity of the other. This can either be forced or voluntary, (2) novation, where the two organisations combine and a new identity is created and (3) structural integration, where each organisation keeps its own identity, with each accepting the validity of the others working practices (Schweiger *et al.*, 1993).

prior to the acquisition. MELCO was "almost the only Japanese company [Apricot] had never done business with"[240]. For MELCO to acquire the former hardware division of a non-Japanese company with which they had no previous connection, and to leave this unit to function autonomously under the MELCO umbrella showed a high degree of sensitivity to the situation. This strategy may have been adopted by MELCO out of a lack of confidence of their ability to manage the integration, rather than a highly planned process of maintaining structural integration:-

> In some cases, the Japanese do not rush in and changes things, because they don't know how to! Some rush in and say "This is Japan now! Why don't you understand us?" This often results in failure[241].

Thus, it was MELCO's inexperience at managing acquisitions, and fear of destroying the value of Apricot that may have led them to adopt a hands-off approach to managing the integration.

The delicacy of the situation was clear to Apricot as well as MELCO. There were many within MELCO who had made it clear that they were not in favour of MELCO and Apricot combining[242]. Apricot's managing director, having witnessed a number of mis-managed acquisitions carried out by Apricot in the past[243], was able to provide the Japanese with guidance for the management of the acquisition:-

> When you're acquired, you've got your own strong opinions and your own culture. You may feel you don't want to become 'Mitsubishi' - I'm 'Apricot'!" [..]. You have to let this negative feeling have its time and manage it well, like a child in a family. You can never force anything upon anyone in life. They must see the benefit, and take it on-board themselves - if it's good, they will, or they're stupid, in which case the person tends to leave[244].

Some within MELCO also seemed to be aware of the benefit of having someone such as Peter Horne heading Apricot:-

---

[240] Interview with Horne, 20/2/96.

[241] Interview with Shigiya, 6/11/95.

[242] "There were a lot of people inside MELCO who were against the acquisition. It was by no mean a consensus" (Interview with Horne, 20/2/96).

[243] Over the years I've seen a lot of acquisitions that Apricot did, and did appallingly, and I've tried to some extent to learn from those. We were typical of all Western companies by having an arrogant view when acquiring a company, and that cannot work" (Interview with Horne, 20/2/96).

[244] Interview with Horne, 20/2/96.

> We respect Apricot and we don't want to force things. Peter Horne is very good for us - it is very difficult to find such a person as him![245].

It became clear to the management of Apricot that, in the short term, MELCO really was going to be, by and large, non-interventionist in their approach to dealing with the UK acquisition. MELCO announced in the Japanese press that "no changes would be made at Apricot"[246].

Apricot continued to buy its 3.5" disk drives from Sony, monitors from the Taiwanese and memory chips from numerous non-MELCO sources. MELCO management was aware that in acquiring Apricot, they had gained a fully functioning PC production and development facility, a strong brand image and access to outlets in Europe, North America and Australia. Consequently, the Japanese had little need to interfere.

MELCO stressed the high regard they had for the management of Apricot, and were particularly keen to see it remain in place following the change of ownership. There are only 8 Japanese permanent employees within Apricot (whose salaries are paid by the UK company). Apricot management are keen to stress the view that the Japanese presence within the UK division was not a network of "spies within the camp"[247]. Of the Japanese in the UK, perhaps one of the most important is the deputy to the Group Managing Director, Yoshihiko Sawai, who acts as deputy to Peter Horne, Apricot's Managing Director. Sawai sees his role as a "cultural translator". The difficult and delicate nature of his work is summed up as follows:-

> MELCO is a Japanese company, a very large company, and Apricot is a British company, a very small one. So we have a lot of 'big gaps' - I take the time to try and solve problems. Our aim is to try and have a successful business for MELCO world-wide[248].

Bringing together these two very different cultures has been no easy task, and this can be clearly seen in the later sections on joint product development.

---

[245] Interview with Daisuke Goto, 15/3/96.

[246] *Asahi News Service*, 12/4/90.

[247] Interview with Horne, 20/2/96.

[248] Interview with Sawai, 20/2/96.

Benefits of the acquisition to Apricot

Survival

Becoming a member of a $36 billion corporation provided Apricot with a level of security for its future that it had never had in the past. In simple terms, MELCO rescued Apricot:-

> We wouldn't be here today if it wasn't for Mitsubishi acquiring us. [..] It is an ideal relationship of a large financial organisation with deep pockets, but one which also understands manufacturing[249].

The financial institutions of 'The City' had in recent years come to regard Apricot as a 'fallen angel'. Having shown great potential for growth since its floatation in 1979, it had gone on to make a number of poor strategy decisions. The financial institutions did not seem to be predisposed to helping a company which they regarded as having 'lost its way':-

> [The City] judged that there had been too many changes in direction; the range of computers, while technically advanced, was not designed with any particular marketing strategy in mind. Here was a company which promised a lot, but which continually failed to deliver profits[250].

Apricot as a whole had become an easy take-over target, and a hostile take-over could have resulted in the destruction of a company whose basic technology and brand name was still highly regarded. MELCO's purchase of the hardware division and the formation of links between the newly separated software and services division of ACT ensured that not only would Apricot's future as a hardware manufacturer be ensured, but also that ACT would be in a much stronger position having a guaranteed source of revenue from MELCO.

The 'Mitsubishi Electric' name

Having the MELCO name associated with that of Apricot effectively provided a guarantee to the world that Apricot would survive. What was needed, however, was a way of combining the identities of the two firms in the eyes of consumers so that the strengths of both parties could be leveraged to maximum effect. Apricot had a brand image that consumers associated with high quality PCs and servers. MELCO's image was

---

[249] Interview with Horne, 20/2/96.

[250] Harvey-Jones (1990:73).

one that was not particularly well known in European computer markets, but which being 'Mitsubishi' presented an image of robust technology. The firms needed to find a way of combining the two brand images in the most effective way. Initially, Apricot PCs continued to be sold with Apricot as the main name, plus the addition of a discrete MELCO logo. Recently, the MELCO name has been pushed further forward. As will be discussed further on, with the formation of the Mitsubishi Electric PC Division, Apricot has become the brand name of MELCO PCs and servers. See Exhibit 7.4.

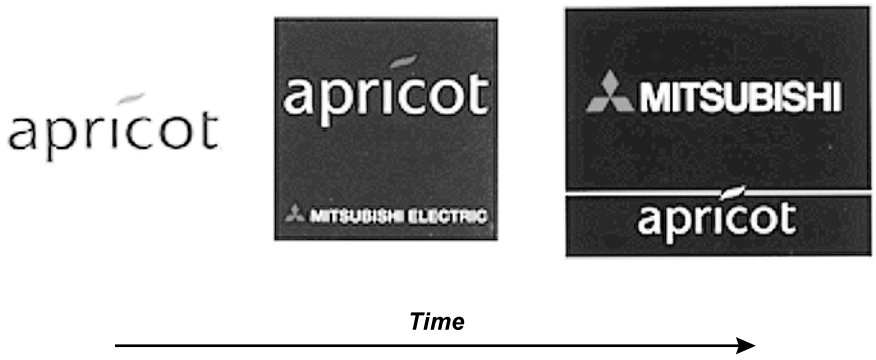


Exhibit 7.4 Changes in branding of Apricot PCs
Source: Company material.

Access to the Japanese market

Being part of the MELCO family gave Apricot an opportunity to expand its horizons. By having a parent based firmly inside the Japanese market, in just two years, Apricot was able to use its new parent to help it gain 37% of the market for file-server systems in Japan[251]. The managing director was able to say that "Apricot now has two home markets, the UK and Japan"[252]. Machines are now sold in Japan under the Apricot brand name, but through MELCO distribution channels. Access to Apricot's strength in UNIX systems came at just the right time for MELCO, as the Japanese market for these systems was growing fast.

[251] *Computer Weekly*, 1/4/93.

[252] Peter Horne, as reported in *Computer Weekly*, 1/4/93.

Benefits of the acquisition to MELCO

MELCO acquiring technology

Despite the professed high regard for the management of Apricot, it seemed that MELCO viewed most of Apricot's value as lying in its technology.

> The PC industry is technology driven, so when MELCO decided to buy Apricot, they understood that they were buying the technology, not the business[253].

It became clear that access to MCA technology, which had been one of the major factors influencing the decision to buy Apricot[254], was not going to give MELCO the advantage it had hoped. IBM's MCA based PS/2 system had not been at all successful. IBM had found that it was no longer able to dictate the direction of technology within open systems based computing. As consumers had begun to enjoy the freedom and choice provided by access to clone products and a wide range of third party peripheral providers, they had no wish to return to what would have effectively been a proprietary IBM system. The market for PC-AT compatible machines continued to grow, while the market for PS/2 hardware running OS/2 operating system remained a niche product.

However, Apricot had more than just MCA technology. Apricot had also developed competence in producing PC-AT standard machines. Another technological benefit for MELCO was Apricot's strengths in UNIX based systems for file servers. This provided MELCO with valuable technology just at the time when the market for these devices was developing in Japan. MELCO had found it hard to build up business in this area, and needed to broaden its product range[255]. As the UNIX market grew in Japan, Apricot became MELCO's "secret weapon"[256] in the battle for market share[257].

---

253 Interview with Sawai, 20/2/96.

254 Interview with Daisuke Goto, 15/3/96.

255 *Newsbytes*, 8/8/90.

256 *Computer Weekly*, 1/4/93.

257 In addition, the year after acquiring Apricot, MELCO went on to sign an agreement with Hewlett-Packard in the US for the right to sell the US firm's workstations in Japan under the MELCO name, as well as working on joint UNIX hardware and software development projects (*Computergram International*, 14/5/91).

Knowledge of how to sell PCs

When MELCO bought Apricot in 1990, there were those within the Japanese corporation who seemed to justify the acquisition by placing it in terms of the acquisition of technology, in this case MCA technology, a concept with which MELCO was more familiar with than acquiring a complete business:-

> MELCO was still thinking in terms of technology. So it was not really much of extension of the old attitudes - it was simply getting technology from outside. They were not really thinking of the business issues, just how to get the technology. They just thought they could buy this technology from Apricot and apply it in Japan for their own products[258].

However, since the acquisition, there has come the realisation that there is also the business skills that have been gained by acquiring Apricot.

> But the PC technology is getting very simple, so they started to take the product as it was and sell it to the Japanese market. There are those outside of the information technology group who realised that they had bought the *knowledge* of how to sell the PC world-wide.[259].

In line with wider trends, MELCO was facing the challenge of how to move away from being a company which was highly focused on providing technology for the domestic Japanese market. Apricot provided MELCO with a set of skills for developing the business of selling PCs internationally.

Use of acquisition to drive a change in management style

For MELCO, the acquisition of Apricot marked the Japanese corporation's first attempt at managing the ownership of a foreign firm. There had been many joint ventures with non-Japanese firms in MELCO's 75 year history, but never before had MELCO attempted a complete take-over of a foreign company. Consequently, there was a great deal of uncertainty that surrounded the deal itself and the management of the post-acquisition integration process:-

> There had been investment in foreign companies before, but this was the first 100% ownership. So nobody [in MELCO] knew how to manage this kind of company. So it was quite unique for us. [..] We need to be a more transnational, a more globalised company. In that sense, Apricot is at the

[258] Interview with Sawai, 20/2/96.

[259] Interview with Sawai, 20/2/96.

frontier![260].

Apricot management realised that MELCO was undergoing a period of change, and that Apricot was the experiment that would, to some extent, map out the future of certain areas of MELCO's strategy in the information technology sector:-

> In a way, we are leading that change [in MELCO's management style]. I'm not trying to sound too presumptuous, but basically, we are the experiment that will prove or disprove the ability [of MELCO to change its management style], so a lot of responsibility rests on our shoulders to see 'Does it work, or not?'[261].

Apricot as a cultural filter

The fact that Apricot was a UK based company also played a part in persuading MELCO that there was a good chance that the companies would be able to work together. Having a UK subsidiary specialising in PC development, production and distribution of PC products allowed the Information and Communication Systems Group of MELCO a 'filter' when dealing with the US computer component suppliers:-

> One advantage of having a UK company is that they are very close to talk with US people, as they are both English speakers. Communication via such a company as Apricot is much better than direct from a Japanese company, for example when dealing with Intel or Microsoft[262].

Such comments indicate the level of problems faced by MELCO in attempting to compete in non-Japanese markets and work with non-Japanese companies.

MELCO using Apricot as a 'learning partner'

Apricot, having been a small player in the IT industry had always been forced to rely upon external relationships. As such, they were an ideal 'learning partner' for MELCO:-

> My classical way of describing this is as a family, where you have mutual respect and trust. If you don't, almost nothing can be done to resolve problems, and I think this is true of business as well. You have to start off on the basis that they are like me, and say 'I trust people', and view them as innocent until proved guilty. It means that you have to be slightly naive, but I think that is the best way to build successful long-term partnerships. It doesn't mean that you can't check detail, but it is a basis on which you can start off. The PC industry is one in particular which works in that way. Nobody, apart from maybe Intel and Microsoft, really controls anything. The rest of us have to rely on lots of

[260] Interview with Sawai, 20/2/96.

[261] Interview with Horne, 20/2/96.

[262] Interview with Daisuke Goto, 15/3/96.

> relationships where there has to be a lot of trust. We have a good foundation to start with: we are an open company, we wanted to work with people, we *like* working with people, we like *learning* from other people. It's great to gain knowledge from other people you work with. [..] Of course, you are bound to get some frustrations and ups and downs, but hopefully never so great that you can't resolve them[263].

Peter Horne's positive attitude towards the Japanese parent has allowed the UK subsidiary to surmount the more tricky issues of attempting to integrate the competencies of two very different companies following an acquisition:-

> [MELCO's] management style is never to criticise, ever. What is the benefit of criticism? Anyone can criticise. The main issue is 'How can I help?' You may get some of the junior [MELCO] guys criticising, but never the senior guys. They are always supportive. They have a good management style capable of overcoming these issues. So we were really involved quite a lot on just day-to-day things - discussing business issues and attempting to understand how we got on. At first, there was the financial planning process, which seemed burdensome, and the planning process. Obviously, at first we had to provide a lot more information than we had done in the past. For the first year or so, it appeared like a huge amount of work, but then I clicked on that this was actually great. For the first time we were actually questioning our own business in detail.[264].

However, the fact remained that the two companies had fundamentally different cultures. MELCO was a very large, Japanese company who had grown strong in the manufacture of heavy electrical machinery for the Japanese market. Apricot was a small UK based company with limited international experience, whose strengths lay in producing technologically excellent computer products for a fast changing, predominately Western, market. Putting these two very different organisational and national cultures together was clearly going to raise a number of managerial issues, if the identity of Apricot was to be retained and allowed to function autonomously within MELCO. The experiences of both sides in joint product development illustrate these issues most clearly.

Joint Product Development

Despite the companies' professed mutual high regard for each others abilities, there were problems in trying to get the two companies to work together on joint projects. One

---

[263] Interview with Horne, 20/2/96.

[264] Interview with Horne, 20/2/96.

MELCO manager put a very positive slant on the issues that emerged:-

> At first, both parties were unhappy. Apricot engineers complained that 'We cannot understand MELCO!' But, after long discussions, it became clear that the most important issue was how to open access to information. Apricot is always open - this we think is a typical Western style - but Japanese style is always to hide information, to be confidential with all information. This was the reason for a lot of the problems and misunderstandings. After we had opened the way for discussions, things became better[265].

He went on to describe an example problem area in joint product development:-

> Apricot is always surveying the market to find the best chip-set - they don't automatically always choose Intel. New chips always have some bugs in them, so sometimes, Apricot will choose a chip-set with bugs in for a new product. Engineers on the Japan-side will always ask 'Why did you do that? Why didn't you ask us first?' We have a lot of information we can give to Apricot. Now, they always ask us to recommend a chip set before they decide. This is the way things should be - always discussing things openly. [..] So, at first we had a lot of problems, but now we are much better. It is a learning process[266].

Problems such as those which emerged during the joint development of a network server are a particularly graphic illustration of the issues that arise. In 1994, MELCO mainframe engineers were brought to the UK to help on the development of Apricot's 'network superserver', code-named 'Shogun'[267]:-

> [..] the problem is that in the MELCO case, they have more formal procedures than Apricot. So, when we decide to make a product like the Shogun, there are some problems. The first thing we do in MELCO is to always write down some goal specifications. After fixing such goals, it may take one or sometimes two years for the product to be developed. In that time the market may have changed. So, we may have to 'spec-up'[268]. For Apricot, they are very flexible to change the specifications - almost every day! If something happens, or some new technology appears, they [Apricot] will change, and this is very easy for them to do.
>
> For MELCO, it is more difficult. So Apricot cannot understand whether the delay from MELCO is a *real* delay, or just a delay in the 'spec-up' process. When they 'spec-up', MELCO engineers must go through a series of point checks. We [MELCO] have been around for 75 years and mainly operating in the heavy industry sector. In such areas, the goal is fixed early on - for an elevator or a factory machine. In the PC field, it is very different, but MELCO has not changed. Apricot is much more

[265] Interview with Daisuke Goto, 15/3/96.

[266] Interview with Daisuke Goto, 15/3/96.

[267] *Computer Weekly*, 31/3/94.

[268] Formally modify the specifications and goals of the project.

> flexible [than MELCO][269].

Overall, attempts to jointly develop products have not met with great success, but have had one use in highlighting what the companies *cannot* do together. The development of certain products has used engineers from both MELCO and Apricot, but the view from Apricot's side was that:-

> [..] it is just too difficult. You just increase the problems of the project without their being enough benefits[270].

Even with other joint R&D projects there have been problems which have resulted in Apricot's reluctance to work too closely with MELCO. The solution, from Apricot's side is to use the resources of MELCO on what the Apricot Group Managing Director describes as "a consulting basis".

Organisational changes within MELCO

The appointment of a new president, Takashi Kitaoka in June 1992 was trumpeted as the beginning of a new era for MELCO. In 1994, he announced the beginning of a project entitled 'Vision 21'. This project will attempt to "develop new businesses and is aimed at transforming Mitsubishi Electric into a transnational company"[271].

In an effort to increase the synergy between the diverse product groups their number has been increased from six to nine, and integrated the overseas marketing function, formerly under the control of a separate group, into each systems group. In the past, each of the systems groups had focused on production and domestic marketing only. If products were to be shipped overseas, they were passed on to the Overseas Marketing Group. However, with the appreciation of the Yen making it necessary to shift some of the manufacturing functions (especially in the field of heavy machinery and consumer electronics) overseas in order to remain competitive, having a separate group handling all overseas actives made little sense. For the Information and Communication Systems Group, shifting the

---

[269] Interview with Daisuke Goto, 15/3/96.

[270] Interview with Horne, 20/2/96.

[271] MELCO company report, 1995.

overseas function to within the group has been particularly important.

As MELCO attempts to build-up its skills in open systems based computing and to compete again in the highly volatile PC market, to have overseas production and marketing facilities tied into the heart of the Information and Communication Systems Group is essential[272].

Changes in the computer industry and convergence

The anticipated formation of the digital industry is impacting upon the strategy of MELCO:-

> MELCO realise that in the long term, their business has to change. In the 21st century, it will not be about solely building objects. There's not much money to be made in building PCs and TVs and VCRs. Things have to change. However, the culture of [MELCO] is a manufacturing company, so how do you go about changing that?[273].

What MELCO is attempting to do, and what 'Vision 21' in part entails, is to find ways of gaining synergistic benefits from having diverse interests in communications, consumer electronics and computers, i.e., three major elements of the digital industry. But as to how such interaction will be achieved, this remains unclear:-

> It *should* happen. But each group is still very different. They each have their own problems and don't want to take new ones from another division![274].

MELCO also seems to clearly realise the importance of learning how to manage alliances, and how this will become ever more critical as they head into the digital industry:-

> In such an industry, it is very difficult for one company to succeed alone. [..] As we move from analogue to digital no one company can have such a big product line as to cover all digital technologies quickly. That is the main problem for MELCO - how to respond quickly[275].

Formation of alliances

MELCO is forging ahead with its plans to externalise to allow the firm to compete more

---

[272] Interview with Daisuke Goto, 15/3/96.

[273] Interview with Horne, 20/2/96.

[274] Interview with Sawai, 20/2/96.

[275] Interview with Daisuke Goto, 15/3/96.

effectively in the new competitive environment[276]. In the six months prior to March 1996, MELCO had set up some thirty alliances. In 90% of these cases, there was no capital participation on the part of MELCO. Such alliances are "easy to manage and easy to divorce"[277].

A number of the more prominent alliances formed since the acquisition of Apricot and aimed at boosting MELCO's ability to compete in the changing competitive environment are given in Exhibit 7.5.

Partner	Date	Purpose
News Corporation	**1996**	Development with Digi-Media Vision (DMV), a subsidiary of News Corporation, to develop digital TV set-top boxes for world-wide MPEG-2/DVB markets.
E&S	**1996**	Alliance formed with Evans & Sutherland to develop professional 3D graphics products for PCs.
Sun Microsystems	**1995**	MELCO sign agreement to use Sun's Java programming language for use with digital TV set-top boxes and Internet related products.
Pippin	**1995**	MELCO joined the tie-up between Bandai and Apple Computer to produce a CD-ROM multimedia software player for use as an audio player, games machine and Internet gateway, to be called 'Pippin'.
Aimnet	**1995**	Alliance formed with Aimnet, a California-based Internet technology developer, to initiate new Internet services in Japan.
Oracle	**1995**	Agreement reached with Oracle to incorporate the US firm's New Media software with MELCO TV set-top boxes.
Sun Microsystems	**1995**	MELCO, in conjunction with Sun, to develop 3D-RAM technology for use in Sun's workstation to improve ability of machines to process 3-D graphics.
General Magic	**1994**	MELCO joins the growing number of Japanese firms having a stake in the Apple Computer software spin-off, General Magic.

276 Though not without opposition from within: "We will have more alliances and acquisitions, but unfortunately there are a lot of people who still want to control and co-ordinate everything inside - it is still their mentality" (Interview with Daisuke Goto, 15/3/96).

277 Interview with Daisuke Goto, 15/3/96.

Cheyenne Software	**1994**	MELCO signed an agreement to market the US firm's networking software in Japan. This software will be sold in conjunction with networking hardware from Apricot, such as the FTServer.
IBM	**1993**	MELCO announced the beginning of production of an IBM developed PDA. The device was developed in conjunction with MELCO in the US, and were planned to be marketed by BellSouth Corporation in the US.
Samsung	**1993**	MELCO agreed with Korea's Samsung to multisource a new type of memory chip for use with video image processing.
HDTV alliance	**1991**	MELCO joined Matsushita, Sharp, Victor, Pioneer, NEC, LSI Logic and VLSI Technology to produce low cost integrated circuits for use in high definition TV (HDTV).
Hewlett-Packard	**1991**	MELCO announced in May 1991 to jointly develop UNIX operating systems and UNIX-related technologies. This work would tie-in with that of Apricot.

Exhibit 7.5 MELCO's alliance partners
Source: Data from Ft Profile and Reuter Business Briefing

Performance

MELCO's profits fell dramatically in the early 1990s with the collapse of the 'bubble economy' and the continued appreciation of the Yen. The company's net profits fell from over ¥80 billion in 1991 to around ¥20 billion in 1994 (See Exhibit 7.6).

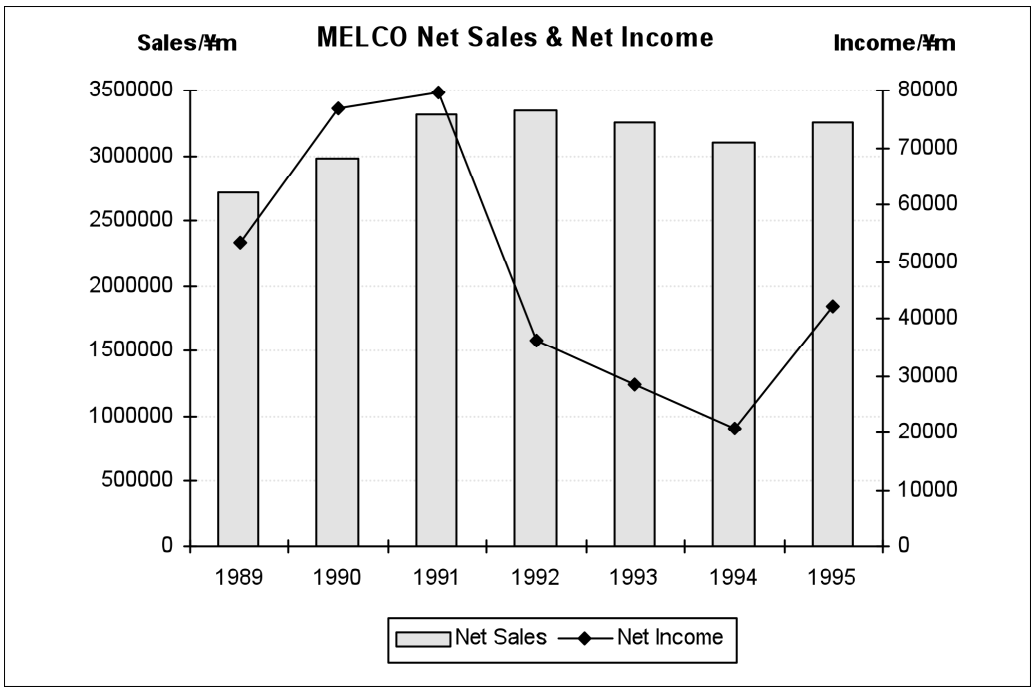


Exhibit 7.6 MELCO's net turnover and net income
Source: Company reports

A recent recovery in profits has been more due to changes in the world markets for

semiconductors and mobile telecommunications equipment than to any radical organisational or managerial changes. The sharp increase in sales of DRAM chips, the growing market for client-server based computer networks and the increasing demand for mobile phones have supported MELCO's profitability recovery. Other product areas, such as heavy machinery, have seen a fall in sales due in part to "excessively strict manufacturing standards"[278] which have made prices for power and industrial systems less competitive than those provided by other firms. In addition, the extended recession in Japan has led to a fall in demand for construction related products, such as escalators and elevators[279].

In 1991, MELCO announced that it would gradually begin phasing out production of its own mainframes in favour of machines produced by IBM[280]. MELCO had, since its entry into computing in the 1960s, found it difficult and expensive to attempt to compete with domestic mainframe rivals such as NEC, Hitachi and Fujitsu. In 1993, the announcement was made that MELCO would withdraw completely from the mainframe market[281], as the general trading situation in Japan for many of MELCO's products worsened, and mainframe sales world-wide continued to fall[282]. MELCO announced that it would focus its efforts in computing on smaller machines[283]. As discussed earlier, MELCO went on to sign agreements with Hewlett-Packard for selling the US firm's workstations in Japan under the MELCO brand, as well as working on the joint development of UNIX software and technology[284].

---

278 MELCO Annual Report, 1995.

279 *Reuter News Service*, 27/10/94.

280 This was the first ever OEM contract for IBM, indicating some pressure for sales within IBM Japan too (*Computergram International*, 27/8/91).

281 "We didn't feel that we had gained sufficient market share to risk continuing", MELCO spokesman quoted in *Computer Weekly*, 1/4/93.

282 MELCO faced a 21% fall in demand for its mainframes in the first 10 months of 1992, as world-wide sales for mainframes fell by 16% over 1992 (*Computing*, 21/1/93).

283 *Computer Weekly*, 1/4/93.

284 *Computergram International* 14/5/91.

Closing comments

On April 1, 1996, MELCO announced the formation of a Personal Computer Division within MELCO with Peter Horne (formerly the Group Managing Director of Apricot Computers Ltd) appointed as President of this new division:-

> This move is the next logical step in Mitsubishi's global strategy for its PC business following the rapid growth of Apricot Computers Limited.[285].

MELCO also announced that it would be investing $200 million in the new PC division. At a recent press conference[286] following the formation of the new PC Division, Peter Horne said that the aim was to put MELCO in the top 10 PC makers world-wide by the year 2002. He proposed sales targets of 1.2 million PCs by the year 2000, and a concurrent doubling of the number of staff in MELCO's PC Division to 1,600. He announced that MELCO plans to get back into the US PC market by forming a sales partnership with a US company during 1997 or 1998.

This latest development in the MELCO/Apricot relationship would seem to indicate that the acquisition has been a 'success' from certain standpoints. MELCO, in acquiring the Apricot, has gained not only the technological capability to re-enter the global market for PCs, but has also now gained a strong, 'Western' management team to help run the division responsible for the development of MELCO's open systems based computing competence. Apricot's experience in PCs, added to their powerful brand image and reputation for technological innovativeness, when combined with MELCO's 'patient' capital and reputation for technological quality is hoped by MELCO to result in a powerful contender in the global PC market.

It will be interesting to observe how the process of joint product development in the new division will be managed, bearing in mind the lack of success noted amongst the participants from both Apricot and MELCO in previous combined projects as detailed earlier. The announcement of the formation of the PC Division included such statements

---

[285] Tatsuya Mutoh, Director of MELCO's Information and Communications Systems Group, as reported on Apricot's WWW page, 9/4/96.

[286] *Reuter News Service*, 1/4/96.

as "collaboration between the UK and Japan on new product design is vital" and talked of the "unified work environment" that will exist in the new PC Division. How to overcome the problems observed in previous attempts to get Apricot and MELCO engineers to work together will be a challenge for both organisations. The companies have had 6 years to work together, and obvious areas of conflict have been identified which may smooth the process of on-going integration.

The announcement of the formation of a PC Division within MELCO, and that MELCO plans to get back into the US PC market[287] by forming links with an, as yet, un-named US company in 1997 or 1998 may be one indication of how MELCO has recognised, and is using, the strengths of its UK acquisition to learn how to become more of a 'globalised' company. MELCO seems to be realising that to be truly global involves more than just having a presence in many locations world-wide. In some ways, the Information and Communication Systems Group has acted as the path-finder for the 'new' MELCO as described by President Kitaoka in his 'Vision 21' document.

To change a corporation with a culture such as MELCO's requires far more than simply having a new corporate vision[288]. It may be that the newly-formed PC Division will be the catalyst for change within the MELCO structure, or it may result in all the innovativeness and 'external-thinking' people congregating in this area with little diffusion of this newly acquired strength.

[287] *Reuter New Service*, 1/4/96,

[288] Interview with Horne, 20/2/96.

Chapter 8 Case Study C: Kao-Protoscan

Chapter overview

In 1991, the Kao Corporation, one of Japan's largest consumer goods producers, acquired 100% ownership of Protoscan Software Services Limited, a small UK provider of software duplication support services.

Although Kao had been successful in the domestic Japanese market and in south east Asia with its range of household and chemical products, Kao had never really been able to make the leap to becoming a 'global corporation'. The growing market for PCs provided one opportunity for Kao. As the demand for PCs grew, so did the demand for removable storage to distribute software and for transporting data. The most popular form of removable data storage was the 'floppy disk'. These disks conformed to international standards and consequently needed minimal customisation for local markets. Kao was able to enter this market by applying its competences in 'surface technology', initially to provide the raw materials for other disk producers, then in the production of the disks themselves. However, in order to compete in the market for this commodity-like product, Kao needed to develop international production capacity quickly. This it did through a program of acquisitions in North America. In addition to producing the disks themselves, Kao began to see the benefit of becoming involved in related services, such as disk duplication, packaging and distribution for software companies.

Protoscan Software Services was set up in the late 1980s to provide services relating to the mass duplication of software on floppy disks. Despite doing well initially, the firm lacked the capital to invest in emerging technologies, such as CD-ROM duplication. Without this, the firm would have been unable to attract the custom of the big software houses. Protoscan needed to find a way of raising sufficient capital to break out of the 'start-up mode' in which it found itself stuck. Kao approached Protoscan having selected them from a search of potential duplication facilities across Europe. After some hard negotiations, Kao bought the company from the founders and Protoscan has since been integrated into the Japanese firm as Kao Infosystems UK..

Kao Corporation

The origins of the Kao Corporation date back to 1897, when the Kao Soap Company was founded to produce "a high quality soap that was as good as any imported brand at a more affordable price for the Japanese consumer"[289]. The corporation has since grown into Japan's largest toiletries manufacturer[290], with a turnover of almost US$8 billion. It has managed to acquire the label of "the Proctor & Gamble of Japan"[291] and has been ranked as one of Japanese 'top ten excellent companies'[292].

Kao's product range has diversified from its original core of detergents into five main areas (See Exhibit 8.1 and Appendix III). However, its 'Household Products' (the three product groups based on detergent, cosmetic and hygiene products) still account for 87% of turnover.

		1991	1992	1993	1994	1995
Household	*Personal care and cosmetics*	34	34	35	36	34
	Laundry and cleaning	40	40	39	39	39
	Hygiene and bath additives	12	12	13	12	13
Chemical	*Fatty chemicals and edible oils*	4	4	4	4	4
	Speciality chemicals and IT products	9	9	9	9	9
Total		**100**	**100**	**100**	**100**	**100**

Exhibit 8.1 Kao's main product area by percentage sales
Source: Company reports

Kao consistently draws around 80% of sales from the domestic Japanese market (See Exhibit 8.2).

---

289 Ghoshal & Butler (1992).

290 Leading Japanese competitors in the domestic market are Lion, Uni-charm, Tsumura and Sunstar, plus the non-Japanese affiliated firms of Nippon Lever, Proctor & Gamble, and Johnson & Johnson (Ohsono, 1995).

291 *Associated Press,* 25/4/95.

292 Butler (1995) using data published in *Nikkei Business*, 9/4/90.

	1991	1992	1993	1994	1995
Japan	85	80	79	81	81
Outside Japan	15	20	21	19	19
Total	**100**	**100**	**100**	**100**	**100**

Exhibit 8.2 Kao's percentage sales by region
Source: Company reports

Domestically, the corporation has one quarter of the shampoo market, half of the laundry detergent market, over half of the market for household cleaners and three-quarters of the market for bleach[293]. Kao has managed to weather the worst effects of the Japanese economic downturn remarkably well, with both net sales and net income showing steady, if unspectacular growth over the past 15 years.

The corporation has acquired a reputation within Japan of being a highly innovative company which is able to dominate the markets it chooses to enter. Two well publicised examples illustrate the firm's developmental and marketing prowess. Firstly, in 1983 Kao developed the 'Merries' brand of nappies which managed in the 12 months following its launch to overtake the market leader from the giant multinational Proctor & Gamble. Secondly, in 1987 Kao launched its concentrated laundry detergent, named 'Attack' which went on to gain almost half of the market for detergent in Japan[294].

One recent example of their innovative management activities which has caught public attention is the setting up of a 'virtual factory' in Japan. If the test link-up of two Japanese plants in Kyushu and Wakayama are successful, it is planned that all of Kao's nine domestic production facilities will be controlled centrally via a fibre optic network, operating as one 'virtual factory'[295].

Kao has maintained a strategy of steady expansion and owes its success to a number of factors. Firstly, the company is highly vertically integrated, owning not only the facilities providing much of its raw material requirements for the detergents and cooking products,

---

[293] *The Economist*, 30/3/96.

[294] Ghoshal & Butler (1992).

[295] Kao (1995).

but also its own network of distributors which deal exclusively with Kao goods. These distributors, or *hansha*, provide a secure outlet for Kao goods. They also act as a conduit for channelling valuable information on consumer trends back to the decision makers within the company[296].

Secondly the management have a clear understanding of the role that scientific research plays in producing successful consumer products. R&D spending has remained consistently high, at around 5% of sales[297], throughout the recent upheavals in the Japanese economy following the 'bursting of the bubble'. The composition of the board of directors reflects this key factor - over half the members of the board have a scientific or engineering background[298].

The third factor that has aided Kao's successful growth has been the efficient use of information technology to keep in touch with changing consumer needs and demands. In common with the other toiletry manufacturers in Japan, Kao has been facing increasing competition from large non-Japanese companies (including Proctor & Gamble, Nippon Lever and Johnson & Johnson) who have entered the Japanese market. These multinational firms are able to apply global economies of scale to manufacturing of their products and thus compete on price within the Japanese market[299].

One way for firms to maintain a competitive edge in this market segment has been to find ways for getting closer in touch with the needs of the consumer. Kao, the largest of the domestic toiletry producers, has successfully implemented an organisation-wide information network which links sales outlets, distribution facilities, production facilities, market research and R&D departments, so as to allow the corporation to respond rapidly to changes in demand[300].

---

296 The role of the *hansha* and the transfer of information in Kao's operations in Japan is described in detail by Butler (1995).

297 Data from *FT Extel.*

298 Interview with Imamura, 18/3/96.

299 Ohsono (1995).

300 The use of information by the Kao Corporation has been discussed by, among others, Ohsono (1995); Nonaka & Takeuchi (1995); Ghoshal & Butler (1992) and Butler (1995).

Kao's need to globalise

Kao's success has been very much focused within Japan. (See earlier Exhibit 8.2). Since the 1960s, the firm has been attempting to become more international, but during the 1980s, only really achieved any degree of success in pushing into the South East Asian markets for its core household products. These markets grew to account for 70% of the non-Japanese sales of Kao products in the late 1980s[301], but total non-Japanese sales remained relatively low. As the 1990s drew closer, Kao needed to find a way of breaking into international markets to be able to compete on a global scale. The then president of Kao gave some idea of the level of the task that faced the firm:-

> Proctor & Gamble, Unilever and L'Oréal are now our competitors. We cannot avoid fighting them in the 1990s[302].

These international competitors were well aware of the potential threat that Kao presented. Having seen the way Kao had produced a stream of innovative products (such as 'Merries' and 'Attack' mentioned earlier) and rapidly achieved market share with them in the Japanese market, they were awaiting with some trepidation the entry of Kao onto the international stage.

Kao did not have a company-wide strategy for globalisation[303]. Rather, each product division was to develop its own strategy for international expansion. The three main options available for expanding production on a global level - joint venture, acquisition and greenfield development - have all been attempted by Kao.

Joint ventures do not seem to have fitted in well with Kao's strategies, and this has been blamed in part on the problems of finding a partner who shares the Japanese corporation's philosophy, and in particular who is willing to share a perspective on building long term market share as opposed to short term profits.[304].

---

[301] Ghoshal & Butler (1992).

[302] Yoshio Maruta, former President of Kao, as quoted in Ghoshal & Butler (1992).

[303] Butler (1995).

[304] Interview with Imamura, 18/3/96.

There have been numerous acquisitions carried out by Kao and they seem to have been more successful on the whole than joint ventures, especially in the North American markets.

> Basically, Kao likes to have 100% ownership acquisitions, because this is simple, and Kao can make the decisions and take on the responsibilities. But we try to pull on their [the acquisition employees'] expertise on how to grow and how to become stronger in the market[305].

Kao entered the European and North American markets by making a number of acquisitions. Among the most prominent of these was the take-over of Andrew Jergens in the US (hair care products) and Goldwell in Germany (cosmetics). However, Kao still found that competing in the mature markets of these two trading areas were very different to the growing markets of South East Asia. Kao did not achieve the anticipated share of the toiletries market and, to the relief of the established players in these markets "did not turn out to be a serious threat"[306].

Kao continued to attempt to find ways of gaining market share in Europe and North America, but it became clear that success would not come in these markets as easily as it had done in Japan[307]. Two factors that had played a great part in Kao's domestic success had much less of an influence in non-Japanese markets. Firstly, a factor which affected the outcome of these attempts was that when operating outside the Japanese market, the valuable consumer information so readily available from the network of *hansha* - the Kao-dedicated distribution channels - was no longer there. Lack of experience in attempting to predict consumer demand in the US caused withdrawal from the US market of certain Kao product lines.

> Kao's fundamental problem was not inappropriate products or marketing strategies, but its inability to understand the differences between markets and adapt appropriately. [Acquisitions and joint ventures] did not provide the local sensitivity and market understanding the company needed, or the entrepreneurial capability to convert such understanding into appropriate product-market strategies[308].

---

[305] Interview with Imamura, 18/3/96.

[306] Anonymous source within Proctor and Gamble.

[307] Bartlett & Ghoshal (1989).

[308] Bartlett & Ghoshal, (1989:8).

Secondly, Kao's use of information technology networks to monitor and distribute information on consumer trends in Japan's domestic market is something which has allowed the corporation to gain competitive advantage over its domestic rivals in its 'traditional' product areas, such as detergents and shampoo. Such competitive advantage has not been transferred to the non-Japanese markets. In the US in particular, as so many companies having been using IT to gain competitive advantage for so many years, Kao gained little by using IT.

It became clear that attempting to globalise using the markets for toiletries would be extremely difficult for Kao to do. What Kao needed to find was a product that was inherently 'international' in nature, i.e., one that required very little customisation for local markets. The growth of the PC market at that time provided one such product.

Kao's entry into IT related products

Attractiveness of the market for 'information consumables'

Aside from toiletries, Kao had a second product area it was hoping to use to help the company acquire a wide international presence. In the mid-1980s, Kao had seen one potential area presented by the growth of the PC. As the demand for PCs grew, so did the demand for 'removable data storage' to distribute software, and for transporting data. The most popular form of removable data storage for PCs was the 'floppy disk'.

This disk is a relatively simple device consisting of a magnetically coated plastic disk encased in a protective sleeve. These disks conformed to international standards and consequently needed minimal customisation for local markets. If Kao could enter this market, floppy disks then represented an 'easier' way for Kao to achieve an international presence than toiletries, which required a high level of localisation and an intimate knowledge of consumer needs.

How to apply existing resources to this new product area?

By having a strong focus on R&D, Kao was able to leverage its competence in surface

science "relatively easily"[309] into floppy disk related products:-

> The manufacturing process for the production of floppy disks is just like any other manufacturing process, it's just that in this case there are *very* high tolerance levels required[310].

By breaking down the various component processes that were involved in the production of the floppy disk, Kao saw that it was possible to apply their knowledge of fine powders and coatings accumulated in the development of cosmetics to the production of 'magnetic media' (See Exhibit 8.3).

Having seen a way of leveraging their competence to provide a point of entry, Kao entered the information storage media industry in 1985 with the establishment of the Information Business Center in Japan. The following year, an Information Sales Office was set up in California and the first Kao brand 3.5 inch, 5.25 inch and 8 inch floppy disks were shipped. The division responsible for the production of these disks was the 'Infosystems' division.

Kao realised that selling directly to end users through the retail channels competing against industry leaders with strong brand images such as Maxell and TDK would be very difficult. Instead, Kao chose to focus on the OEM and public sector markets. The service they were able to offer as an OEM supplier pushed them to gain the largest share of the market in the US (See Exhibit 8.4).

---

[309] Interview with Godfrey, 25/4/96.

[310] Interview with Godfrey, 25/4/96.

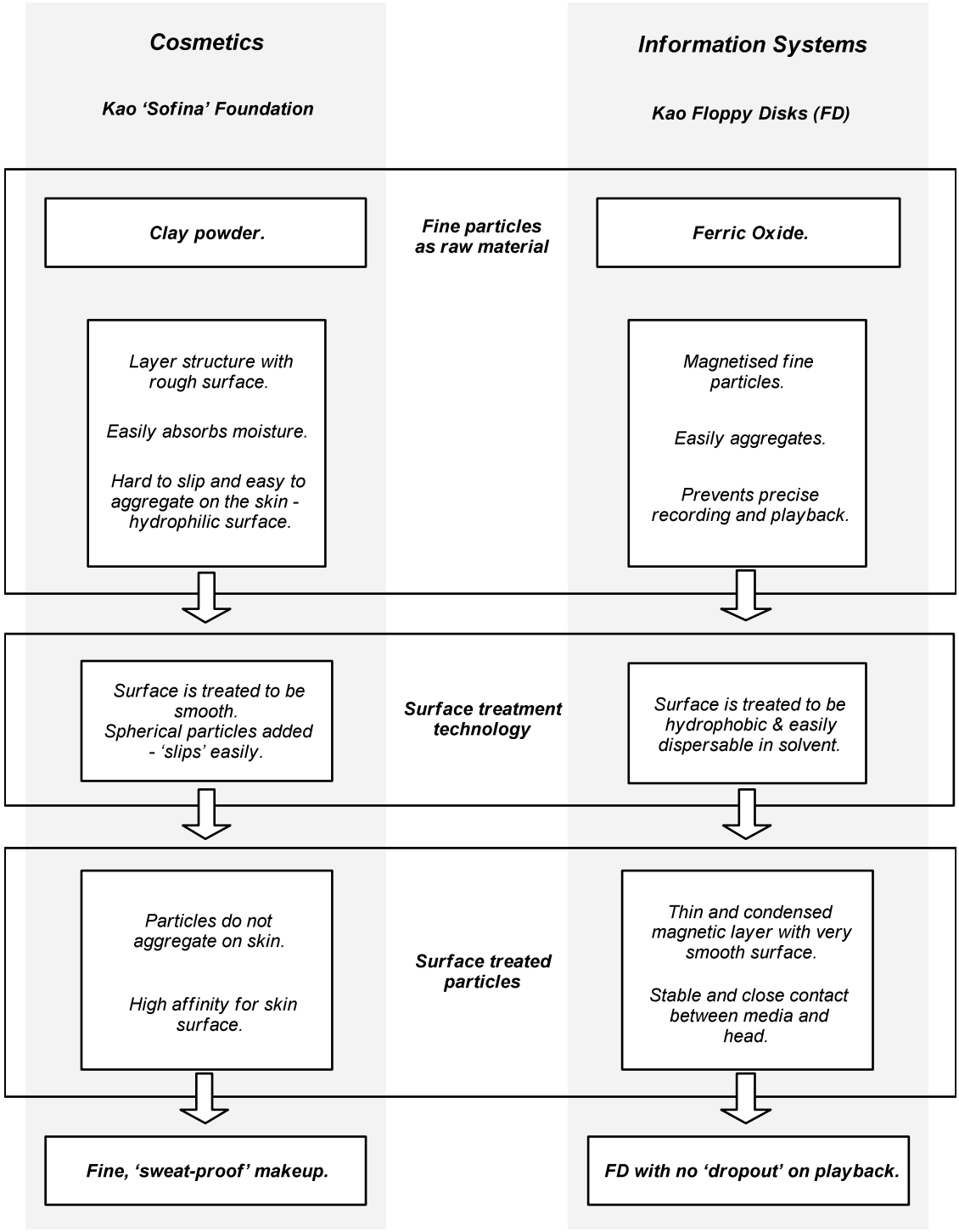


Exhibit 8.3 Kao's application of surface technology to diverse product areas
Source: Kao Corporation, 1996

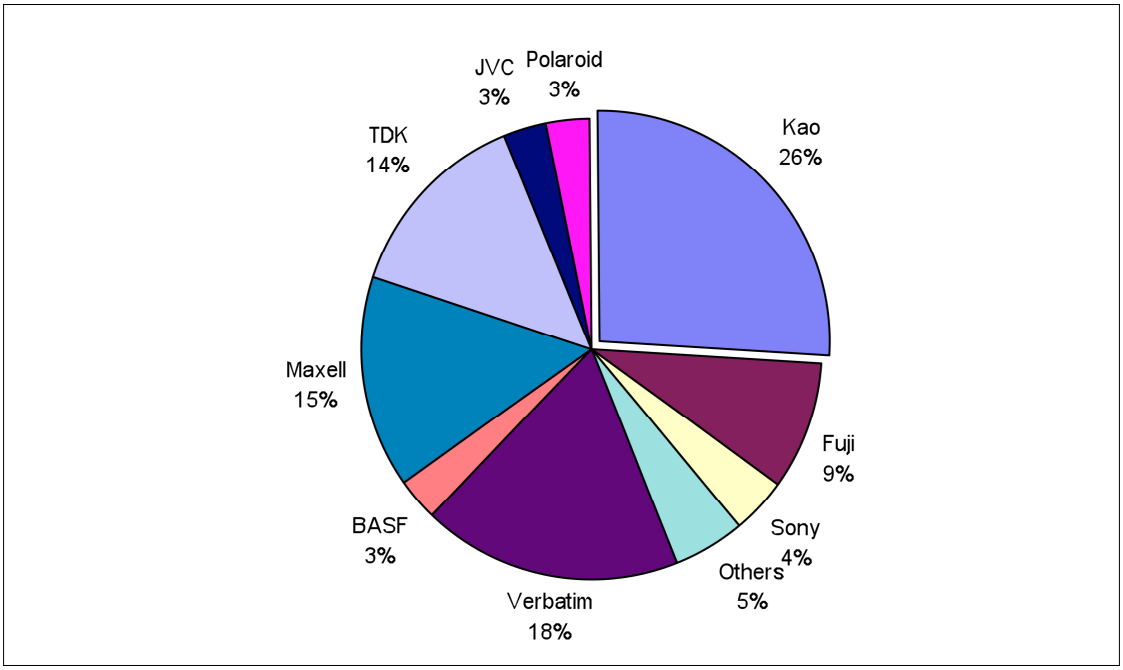


Exhibit 8.4 Leading OEM disk suppliers in US, 1992
Source: Santa Clara Consulting Group, 1992

To achieve success in the world-wide markets for floppy disks, Kao needed to expand rapidly. Magnetic media as the predominant means of removable data storage in the computer industry is predicted to have a limited future. At the time of the Kao's entry in the information storage sector, the market for floppy disks was expanding rapidly, but this was not predicted to last indefinitely[311]. It was therefore necessary for Kao to have a global network of floppy disk manufacturers and duplicators up and running as soon as possible in order to derive maximum profit from the market, before demand declined too greatly. The cut-off point for exiting the market has been predicted as the first decade of the next century[312]. Kao management confessed that they were not so much interested in the technology or managerial skills of the target companies. What was of interest to them was to have the basic business infrastructure in place, ready to receive the investment and strategic guidance from Kao. This was the way in which Kao has expanded into the North

[311] In a recent interview, the CEO of one US removable data storage producer said:- "We believe that the floppy disk is essentially obsolete technology. It isn't big enough to do anything with and it's very, very slow. Software is all shipped on CD-ROM. In fact it's really shipped on the hard drive. Gateway 2000 Inc., for example, pre-configures their machines with the software right on the hard drive. Microsoft Corporation has announced that they're going to stop providing software on floppies. I think that is a huge signal." (*Investor's Business Daily*, 6/5/96). Some within the industry believe that the peak of output of 3.5 inch disks is believed to have been the first quarter of 1996 (Interview with Godfrey, 25/4/96).

[312] Interview with Godfrey, 25/4/96.

American market:-

> Kao needs to have the basic infrastructure. It is then Kao's way to bring our technology and money to expand and utilise this infrastructure. This is the way that Kao develops the technology or business, and that is the way we are expanding into Europe[313].

Within six years, following a number of acquisitions of disk manufacturers in North America, Kao had become the world's leading producer of 3.5 inch floppy disks (See Exhibit 8.5).

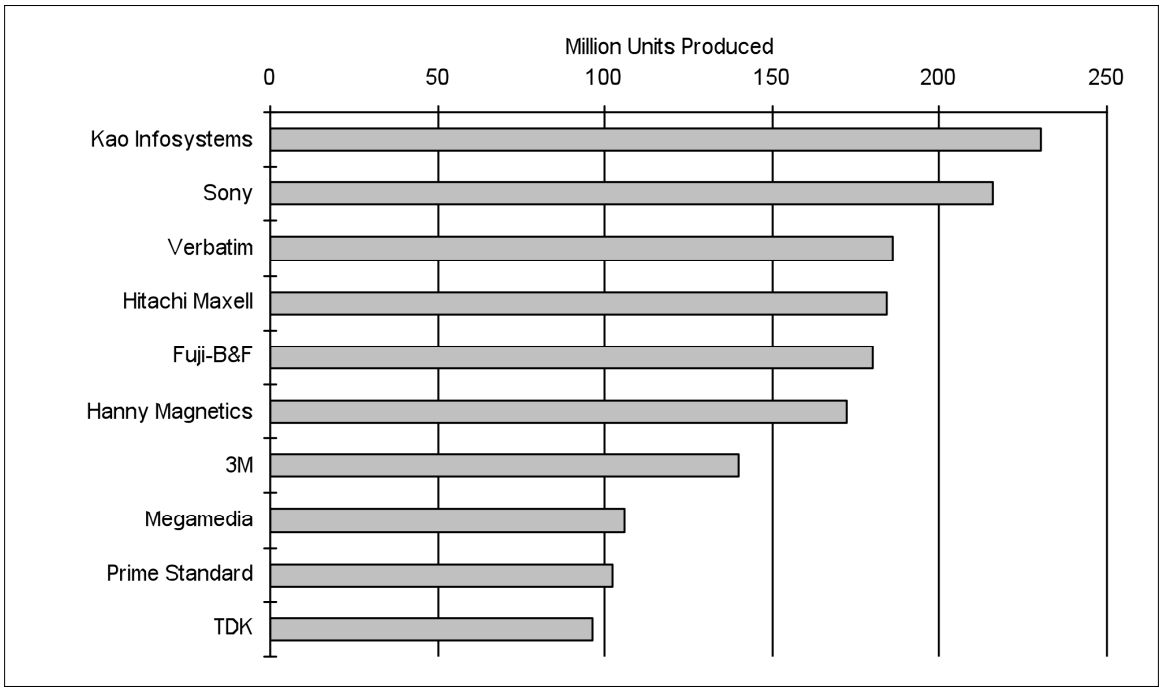


Exhibit 8.5 Top ten producers of floppy disks, 1992
Source: Magnetic Media Information Services, 1993.

The world-wide demand for 5.25 inch and 8 inch disks was gradually declining as technology advanced and user requirements changed. Kao quickly invested money in transferring much of their 5.25 inch production facilities to 3.5 inch production[314]. The convenience and capacity of the 3.5 inch disks had given it the edge in the explosively growing PC-users market, and the 3.5 inch disk had become a *de-facto* standard for much of the low-capacity removable storage requirements of computer users world-wide[315] (See

313 Interview with Imamura, 18/3/96.

314 *Reuter News Service*, 17/8/94.

315 The 3.5" 'micro floppy disk' was an invention of Japan's Sony Corporation in 1980, but achieved widespread diffusion with IBM's selection of this device for the removable storage requirements of the majority of its personal computers. Following IBM's lead, producers of IBM 'clone' PCs have made the 3.5 inch drive a standard feature of

Exhibit 8.6).

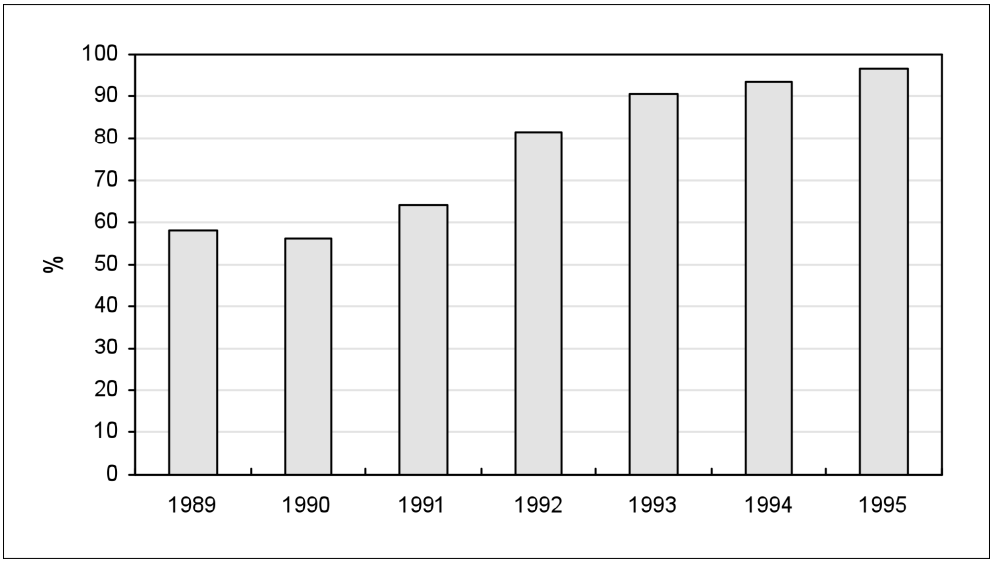


Exhibit 8.6 3.5 inch disks sold as percentage of total floppy disks sold in Japan
Source: Electronic industries Association of Japan, 1996

A large number of Kao's OEM customers were involved in the duplication of software. These firms were contracted by the software developers to mass duplicate the software onto floppy disks. As such, Kao was effectively still providing a 'raw material' for other firms who were acting further down the software distribution 'food-chain' (See Exhibit 8.7).

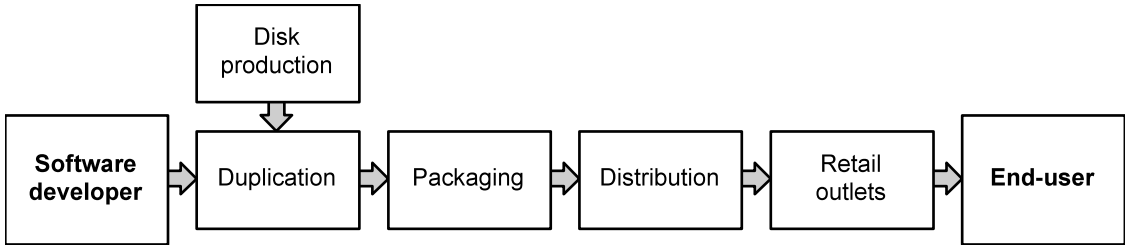


Exhibit 8.7 The FD/CD-ROM software distribution 'food-chain'

Kao saw the potential benefit of becoming more vertically integrated by offering production and duplication services. In addition, many firms involved in duplication were also involved in packaging and distribution. As such, it was attractive to the software developers to be able to have a 'one-stop-shop' to deal with the process of getting the software to the end users.

PCs.

In order to become more vertically integrated, Kao needed to have duplication facilities in key strategic locations. Having acquired a number of duplication facilities in North America, Kao also needed to gain a presence inside Europe. The first step in this process was the setting up of a disk production plant in Barcelona[316]. This provided Kao with a guaranteed source of disks for its planned software duplication service which lay inside the European Union and would thus avoid any import tariffs that would apply if Kao were to bring in disks from North America. Having set up the production plant in Spain, Kao then sought to find a suitable disk duplicator within Europe. After an exhaustive search of possible targets, Protoscan Software Services, then based in St Ives near Cambridge in the UK, seemed to be an ideal target.

Protoscan Software Services Limited

Protoscan was set up near Cambridge in the UK in 1987 by two entrepreneurs, Mike Hall and Andy Eltis to provide services connected with the mass duplication of software. The main services offered were duplication of software on floppy disks, and the protection of software against unauthorised duplication. The company achieved remarkable levels of growth in the early stages by responding to the demand for the 'shareware[317]' disks bundled with home-user computing magazines. During its first three years of trading, the company's turnover doubled every year, from £1.2 million in 1988 to £3.4 million in 1990, and moved from employing 6 people, to 35 full time staff and around 60 part-time in the early 1990s[318].

The company continued to expand and bought-out one of its main competitors. This continued expansion brought with it a real risk of "over-heating"[319], so the founders sought ways to maintain controlled growth. They developed a three year business plan which would hopefully stabilise the growth of this still very young company.

---

316 This greenfield site was set up in 1990, at a cost of $120 million (*Computergram International*, 7/8/90).

317 Software, often written by hobbyists, and distributed free of charge. Computing magazines were able to bundle together the best of the available shareware and give it away free with their magazines. To do this, they needed to be able to mass duplicate the software on floppy disks.

318 Costello (1992).

319 Interview with Tosh, 18/4/96.

The software support services industry was growing rapidly at the time Protoscan was having to re-think its strategy, but demand for the services offered by the UK company was also highly unstable. In the words of one Protoscan manager, "In this industry, it's not so much peaks and troughs, as feast and famine"[320]. What Protoscan needed was an injection of capital which would allow them to move beyond the 'hand-to-mouth' existence they had faced up until then, and on to being able to offer the big software firms a complete service package, encompassing floppy disk and CD-ROM replication, as well as packaging and distribution.

Growing out of 'start-up' mode

In common with many young companies in the high technology sectors of industry, Protoscan were facing problems in raising sufficient capital to allow them to continue to invest in the latest equipment. Investment in state-of-the-art technology would be vital if Protoscan was to remain competitive in a fast growing industry. The equipment being used by the UK firm in the late 1980s was technologically advanced, but new technologies were fast emerging. Aside from the increases in speed of the newer duplicating machines[321], there was the emergence of optical data storage, in the form of the CD-ROM, as a viable means of software distribution. The investment required to be competitive in this field would have been hard for Protoscan to raise.

Beyond the issue of moving to CD-ROM replication, was perhaps a realisation that removable storage technology for software distribution has a limited future in terms of long-term growth. While consumers will always need some form of storage media for their own use, the distribution of software is predicted to be shifting away from magnetic media to optical media (CD-ROM) and then on to direct electronic distribution via the Internet[322]. In addition, it was becoming increasingly common for software firms to enter into agreements with PC manufactures for software to be 'bundled' with the computer.

---

[320] Interview with Tosh, 18/4/96.

[321] In 1990, the average time for the duplication of one floppy disk was 2 - 2.5 minutes. The newest machines can now duplicate in just 22 seconds.

[322] Interview with Godfrey, 25/4/96.

Users would receive a computer with all the basic software they needed pre-installed on the computer's hard disk. As such, there was no need for 'hard' versions of the software on a floppy disk to be passed on to the consumers.

The first stage of this transformation in software distribution was already happening when Protoscan managers were considering the future directions for the company[323]. The future of removable storage for uses other that software distribution was also uncertain. A number of alternatives to floppy disks were emerging, such as magneto-optical disks, recordable CD-ROMs and 'flash' memory cards[324], that would require a whole new range of skills and assets to be internalised by the small UK firm. Aside from the issues relating to whether Protoscan could raise sufficient capital to move into these new fields, there was the problem of knowing which technology was most likely to dominate. There was no one obvious contender to replace the floppy disk. Various niche standards had emerged (such as the SyQuest cartridge drive in the graphic design industry), but there seemed to be no obvious lead-contender for general purpose removable storage[325].

There were additional factors relating to the growth of the company that the Protoscan managers had to consider. In order to attract the attention of the large software developers and publishers whose custom would help Protoscan to break out of the 'feast or famine' cycle, it would be necessary for Protoscan to have an appropriate 'front' to present to potential clients that differentiated them from the "garage operations", which proliferated in the industry[326]. Coupled with the desire to attract the bigger names in software publishing was the need to have an international presence that went beyond Europe.

Kao's first contact with Protoscan

As all these issues were being considered, Protoscan received a cold-call from

---

323 Interview with Tosh, 18/4/96.

324 Non-volatile memory (i.e., memory that is retained after power-supply is disconnected) which can be used as removable storage. Its most common application is in the form of standardised plug-in 'cards' conforming to a world standard (PCMCIA) for use with portable computers. They provide RAM-like access speeds with removable data storage capability.

325 *Investor's Business Daily*, 29/5/96.

326 Interview with Tosh, 18/4/96.

representatives of the Kao Corporation who expressed a strong interest in acquiring an ownership interest in the UK company. While there was a degree of wariness on the part of the Protoscan managers, what Kao had to offer seemed to be just what Protoscan needed, i.e., an international presence, financial strength and a record of success in the software services industry.

Protoscan managers were flattered to have been selected as the best out of the twenty or so European producers that Kao had been considering[327]. The Japanese corporation's experience with acquisitions in the US had given them useful insights when it came to dealing with the negotiations leading up to a take-over of a non-Japanese company[328]. The management of Protoscan seemed to appreciate this and while having some reservations about turning into a subsidiary of a Japanese firm:-

> [..] We weren't keen on the idea of turning into another Nissan in Sunderland, with the exercise and the uniforms, but Kao did seem to be the obvious solution to the financing problems[329].

Kao made it clear that it was not interested in working with Protoscan on any joint venture project, or in taking a minority share-holding in the company[330]. They simply wanted to turn Protoscan into the UK division of Kao Infosystems, and derive the synergistic benefits that were predicted to arise from having disk manufacturing plant (already constructed in Barcelona) *and* a disk duplicating plant within the European Union.

Acquisition

The initial deal presented by Kao for a take-over of 100% ownership of the company was rejected by the founders of the UK company (somewhat to the surprise of the Japanese[331]), but eventually an agreement was reached which allowed Mike Hall and Andy Eltis a potentially lucrative earn-out from the company they had set up. This they

---

[327] Interview with Tosh, 18/4/96.

[328] Interview with Imamura, 18/3/96.

[329] Interview with Tosh, 18/4/96.

[330] Interview with Imamura, 1918/3/96.

[331] Costello (1993).

did, and in 1993, after trading as 'Kao Protoscan' for a just over two years, the founders left and the company became 'Kao Infosystems (UK)'.

Motives for the Acquisition

The motives for Kao's acquisition of the ownership of Protoscan Software Services can be summarised as follows:-

- *The need to achieve critical mass in production and duplication quickly:* At the time of the acquisition of Protoscan, Kao was still developing its capacity in floppy disk manufacturing. To achieve success in the world-wide markets for floppy disks, Kao needed to expand rapidly. Magnetic media as the most popular means of removable data storage in the computer industry is predicted to have a limited future. At the time of the Kao's entry in the information storage sector, the market for floppy disks was expanding rapidly, but this was not predicted to last indefinitely[332]. It was therefore necessary for Kao to have a global network of floppy disk manufacturers and duplicators up and running as soon as possible in order to derive maximum profit from the market, before demand declined too greatly. The cut-off point for exiting the market has been predicted as the first decade of the next century[333]. Acquiring Protoscan was part of this need to grow quickly.
- *Need to be inside Europe*: As part of Kao's plans to globalise, it needed a presence in all major global markets. Though Kao had already entered the European Union through their acquisition of Goldwell in Germany, that move had been firmly centred on expanding the company's share of the toiletries market. As stated earlier, Kao's globalisation strategy rested with each product division. Thus the Information Technology Products division needed to achieve a global presence in its own right. In

---

[332] In a recent interview, the CEO of one US removable data storage producer said; "We believe that the floppy disk is essentially obsolete technology. It isn't big enough to do anything with and it's very, very slow. Software is all shipped on CD-ROM. In fact it's really shipped on the hard drive. Gateway 2000 Inc., for example, pre-configures their machines with the software right on the hard drive. Microsoft Corporation has announced that they're going to stop providing software on floppies. I think that is a huge signal*."* (*Investor's Business Daily*, 6/5/96).

Some within the industry believe that the peak of output of 3.5 inch disks is believed to have been the first quarter of 1996 (Interview with Godfrey, 25/4/96).

[333] Interview with Godfrey, 25/4/96.

terms of this division developing a European presence, this had begun with Kao's construction of the Barcelona facility.

- *Need to have both disk production and duplication within Europe*: Kao saw the advantages of being vertically integrated within the European Union. In order to prevent 'unfair' competition for the domestic producers through the dumping of imported floppy disks into the European markets, the European Commission (EC) had threatened importers with penalty tariffs on non-EU produced disks. These threats were 'temporarily' implemented in 1995, following a flood of low-cost Chinese disks into the EU. In 1996, these penalty tariffs were made permanent. For Kao, having a manufacturing plant in Spain and a duplicating plant in the UK, they were able to avoid these tariffs. Other manufacturers, such as 3M and TDK were able to negotiate their way around them[334].

Post acquisition

Integration issues

Having a clear strategy for what was expected from the target company, and having had experience of integrating acquisitions in the US, Kao was able to use the acquisition of Protoscan as a way to gain rapid access to the software services market in Europe. The process of integration used was one of assimilation[335]. Kao had little need for the name of Protoscan, although as stated earlier, the acquired company did trade as 'Kao Protoscan' for the two years following its acquisition, before becoming 'Kao Infosystems (UK)'.

Kao's experience at managing acquisition integration

Kao's experience of managing acquisitions in the US prior to the take-over of Protoscan had undoubtedly helped those involved to avoid many of the more common pitfalls associated with such cross-border acquisitions.

---

334 *Newsbytes*, 18/4/96.

335 In summary, the spectrum of acquisition integration options encompass the following: (1) Assimilation, where one party adopts the identity of the other. This can either be forced or voluntary: (2) Novation, where the two organisations combine and a new identity is created: (3) Structural integration, where each organisation keeps its own identity, with each accepting the validity of the others working practices (Schweiger *et al.*, 1993).

The information technology related acquisitions date back to the mid-1980s when Kao began its diversification programme. The first acquisition as part of Kao's new strategy occurred in 1986, when the corporation bought-out a Canadian floppy disk manufacturer, Didak. Kao then went on to purchase a number of other companies in North America, including West Coast Telecom, Sentinel, American Helix and the packaged software operations of Microsoft. Attention was focused on North America, as this was where Kao perceived that the biggest market for information consumables lay.

Kao's experience with partnerships had provided them with a keen knowledge of what the corporation was *not* capable of doing. It was clearly imperative for Kao to build on its strengths in surface science through the production of information storage media as quickly as possible. Consequently, Kao needed to move rapidly, and to handle the management of the acquisition integration firmly. Kao seemed well aware that they needed to achieve global presence as quickly as possible, but lacked the resources to do this on their own:-

> If Kao tries to enter the UK market, they will find it very difficult to communicate with UK or Irish people. If we have to set up each part of the infrastructure [R&D, production, marketing, sales, finance and administration] and interview people and sort out salary, job descriptions, it takes too much time![336]

The management of Kao had also learned from dealing with the acquisition of non-Japanese companies that it would be necessary to accept that a variety of different cultures would have to be integrated into forming the global Infosystems division. It was not an easy realisation, despite what had been learned through their experiences in North America:-

> I think they [Kao] came here looking to impress their management style upon our company, but soon realised that Europe is not 'just Europe'. It is a host of over 14 different countries. They quickly realised that in order to manage that 'melting-pot' of cultures, a very different management style was required. I think that is the beauty of working with the Japanese - they are very reflective and understanding, but react to things very quickly and do not force, or attempt to impose their style if it is not required. However, ultimate guidance, profit and loss responsibility and ultimate strategic

[336] Interview with Imamura, 18/3/96.

responsibility does come from Japan[337].

Kao management realised that flooding the acquired organisation with Japanese personnel would not necessarily result in effective control being held over the acquisition. Following a flurry of visits from senior representatives of the Kao Corporation, only one Japanese national remains permanently at the UK operation. This is a policy in common with all the other non-Infosystems regional companies in the EU under the control of the Kao Corporation. The Japanese transfer's role is summed up by Simon Godfrey, OEM Manager at the Huntingdon plant:-

> [The Japanese personnel] do have very key roles. They are directors of the regional companies. Some would say that they are here to act as spies. They are not - they are here to cast a parental eye over what is happening. They hold their discussions internally on a Europe-wide basis, regarding the business as a whole. They manage us in a very 'hands-off' way![338]

The view from Japan seems to be that the acquisition has worked as well as could be expected[339]. Kao's approach of targeting companies in financial difficulty and then applying a set of rigorous financial controls had worked in the past, but not without a few problems[340]. The UK company still suffered from the peaks and troughs of the demand for information consumables, causing the UK firm to post a pre-tax loss of £1.9 million in 1994[341]:-

> [The acquisition] is getting more stable, but we still have a lot of head aches![342]

Clear strategy

Kao had a simple strategy with respect to its entry into IT related markets. This was clearly transmitted to those within the acquired organisation as "to be the biggest and the best"[343] in the field.

The simplicity and logic of integrating Protoscan into the Kao Infosystems network of

---

337 Interview with Godfrey, 25/4/96.

338 Interview with Godfrey, 25/4/96.

339 Interview with Imamura, 18/3/96.

340 Interview with Imamura, 18/3/96.

341 Data from *FAME* company database.

342 Interview with Imamura, 18/3/96.

343 Interview with Tosh, 18/4/96.

companies was explicitly communicated to those in the UK company[344]. There seemed to be a clear idea of what was required of the acquisition:-

> Frankly speaking, we just purchased the infrastructure and the people. We then bring our technology and money. [..] Sometimes these companies are facing very hard times, maybe almost bankruptcy, as they had no real R&D and no access to capital. We are able to use the 'dreams' of the [non-Japanese] workers within the structure of a Japanese company[345].

Protoscan as an appropriate target

Protoscan, being a small, young company which was facing problems raising capital to fund further expansion made itself a very attractive target for acquisition. The UK firm had built up a reasonable customer base, had acquired a reputation for quality and had invested in equipment that had allowed it to grow rapidly up to the point where Kao entered the scene. There were doubts as to whether Protoscan could have continued for long on its own without further investment:-

> I don't think that Protoscan would have survived. It might have done, but would definitely have had problems shifting to CD [technology] and would not have not have been able to have the Internet as a strategy, and to have the financial clout to bring that to market quicker than anyone else[346].

Among the management of Protoscan, there was a feeling that if the UK firm was to succeed, it needed to have the ability to operate on an international scale. This it was unlikely to be able to do on its own[347].

Protoscan's attraction to Kao was, as described earlier, its business infrastructure, but there were also other benefits that Kao saw in the UK firm:-

> Protoscan was perceived as a quality company with a good client base. There were certain clients that Kao Infosystems was serving in the US, but not in Europe. The management style of Protoscan had less to do with it than the footprint of the company, and the springboard into Europe provided by the UK facilities. Maybe it was a decision based 70% on location![348]

---

344 Interview with Tosh, 18/4/96.

345 Interview with Imamura, 18/3/96.

346 Interview with Godfrey 25/4/96.

347 Interview with Tosh, 18/4/96.

348 Interview with Godfrey 25/4/96.

Kao as a 'good parent' for Protoscan

The attraction of having access to the resources of not only the rapidly developing Kao Infosystems network of companies in North America, but also the huge resources of the parent company back in Japan, made Kao a very attractive acquirer from Protoscan's standpoint.

> For us [the Protoscan employees], the acquisition was seen very much as a positive move[349].

Becoming a part of the (comparatively) resource-rich Kao Corporation brought a number of benefits to Protoscan. Firstly, the injection of capital made it possible to move from the old facilities, described as the "little shack down the road"[350] to the larger, more prestigious premises located on an expanding business park on the outskirts of Huntingdon in Cambridgeshire. This was a very important move in terms of changing customers' view of the UK firm:-

> It's certainly a matter of perception as far as our clients are concerned. When they come to our facilities, they see that they are very clean and well organised, and that gives us many, many points in the eyes of our biggest customers. There are many of the 'garage' type operators who never win the better accounts[351].

A second benefit of this connection with a resource-rich parent was that the future of the UK operation became much more secure. Having the financial backing of a large Japanese parent removed any doubt as to the ability of the UK firm to survive all but the worst of the 'famines' that strike young companies in this sector of high technology industry.

The third benefit Kao provided was that it now gave Protoscan an international presence. Companies such as Microsoft[352], Novell[353] and Compuserve[354], who, in the past might never have considered outsourcing some of their software distribution requirements to a

---

[349] Interview with Tosh 18/4/96.

[350] Interview with Tosh 18/4/96.

[351] Interview with Godfrey 25/4/96.

[352] The world's largest producer of PC software, and developer of the world's leading PC operating systems, 'Windows', and 'Windows 95'.

[353] The supplier of 'NetWare' the world's most popular software for networked PCs.

[354] A leading Internet service provider.

small operation such as Protoscan, were much more willing to use a company with global presence:-

> In being global, you attract a certain sort of customer who is global as well, and this has a knock-on effect. If we had been just one duplicating plant, Microsoft would not have entertained the idea of using us, because we simply wouldn't have been big enough. Novell will use us because we are big. They would not use some little operator down the road, because they cannot bring any clout to market[355].

Kao as an atypical Japanese company

Within Japan, Kao has gained a reputation for being a highly innovative company. Its structure, management and history have been studied by academics as "a true pioneer of knowledge management"[356]. Its sudden and successful move into information technology products through a spate of successful acquisitions, rapidly increasing the company's market has been looked upon with much admiration by observers[357]. Choosing to fuel this diversification strategy by acquiring companies in North America could easily have gone wrong. As discussed in Chapter 3, Part III, Japanese firms have faced a number of major problems when attempting to acquire overseas. By having a clear view of what was expected of the acquisition ("We just wanted the business infrastructure [..]"[358]), Kao managed to integrate the resources of the acquired organisation successfully into the newly formed Infosystems division.

By entering the market for information technology related products through these acquisitions in the US and by selling predominantly to the OEM market, the 'Japanese-ness' of Kao was almost diluted away to Western observers. The name itself is almost neutral in sound. Consequently, by not being perceived as a Japanese company, certain aspects of the "culturally frustrating incidents"[359] that plague cross-border acquisitions were avoided.

---

355 Interview with Godfrey 25/4/96.

356 *The Economist,* 30/3/96.

357 Butler (1995); Nonaka & Takeuchi (1995).

358 Interview with Imamura, 18/3/96.

359 Osigweh *et al.* (1993).

The strong influence of the North American side of Kao Infosystems has meant that, while the Kao Corporation in Tokyo may remain staunchly mono-cultural, the Infosystems division is remarkably multi-cultural in outlook, by Japanese standards.

> Kao Infosystems is really a Japanese company, run by Americans and managed by Europeans![360]

This view was heard elsewhere in a slightly different form:-

> The good part about Kao Infosystems is that it is not just a Japanese company. It is an American company as well. So you have the application of the Japanese, the vitality of the Americans with their vision and enthusiasm, and you have the common sense of the Europeans. And these three groups balance each other very well. You will always have cultural difficulties when you have three groups like that out together, but it can work, and when it works well, it works *really* well[361].

Changes in the computer industry

Kao and information storage media

In the early 1990s, the changes in the computer industry were having a marked impact upon the strategy of Kao's Infosystems division in two ways. Firstly, there was a need for Kao to know which of the emerging media, aimed at replacing the 3.5 inch floppy disk, to back. Secondly, the dramatic growth of the Internet had shown that there was an alternative to 'hard' software distribution.

Which media to back?

As the PC industry grew, a feed-forward cycle of hardware and software development gathered speed. As computers grew faster and more powerful, it became possible to run more complex software. As the software grew more demanding in its requirements for the hardware, so the hardware had to leap ahead to match predicted software requirements. In turn, the software developers were able to add more features to each application. As mainstream applications began to incorporate graphics, sound and video, the need for high capacity data storage for making back-ups and transporting data increased. The 3.5 inch floppy disk, which had been developed in the 1980s was becoming too slow and

---

[360] Interview with Tosh, 18/4/96.

[361] Interview with Godfrey, 25/4/96.

small to meet the requirements of computer users in the mid-1990s[362]. Many new storage technologies had emerged since the introduction of the floppy disk in the 1980s, but none had shown itself to be a clear winner in the race for a replacement for the floppy disk for both user storage requirements and software distribution. These two markets were becoming increasingly separated. For the users to backup their data, the MO disk was showing itself to be popular choice, but still there were niche strongholds that opted for other choices, such as the SyQuest cartridge and DAT. As software applications grew larger, the most common form of 'hard' distribution was the CD-ROM. If Kao was to remain strong in the field of removable storage, then it needed to have competences in all of these areas, as well as emerging technologies, such as DVD and CD-R for home use.

Moves away from 'hard' software

The future of the software distribution and storage industry is predicted to lay in areas other than magnetic media[363]. The explosive growth in the use of the Internet[364] has opened up a new opportunity area for the distribution of software. Instead of the transfer of software from the developer to the duplicator, the transfer to 'hard' copy, the packaging, distribution, retail marketing and then final transfer to the end-user, the Internet provides a 'direct' link from developer to end user (See Exhibit 8.8).

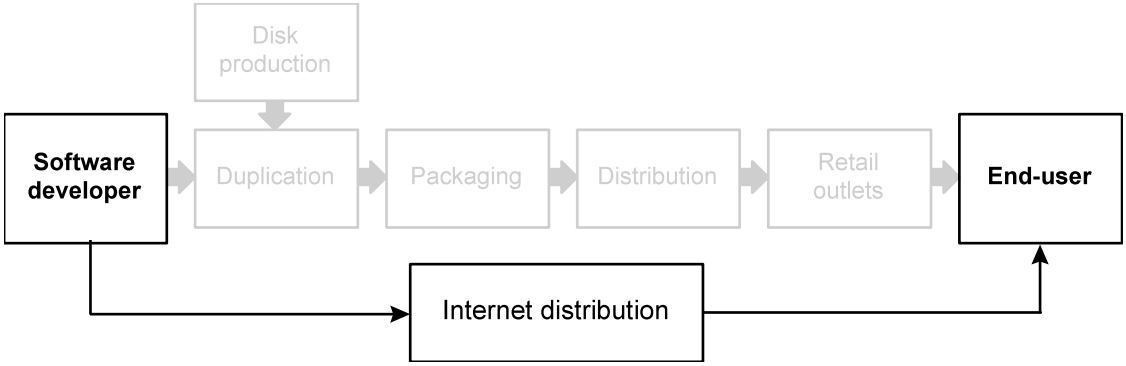


Exhibit 8.8 Use of the Internet for direct software distribution

362 "[..] the floppy disk is essentially obsolete technology. It isn't big enough to do anything with and it's very, very slow. (*Investor's Business Daily*, 6/5/96). Some within the industry believe that the peak of output of 3.5 inch disks is believed to have been the first quarter of 1996 (Interview with Godfrey, 25/4/96).

363 Interview with Godfrey, 25/4/96.

364 See Chapter 2 for further details.

Consequently, competences far removed from the 'surface science' technologies that provided Kao with an entry point into the IT sector would be required in order to maintain market share. It was in these areas that Kao management realised they lacked expertise. The acquisition of businesses already operating in the software distribution industry gave the Japanese access to much tacit knowledge relating to the 'next stage' of the industry's development.

Kao's emerging strategy

It still remains unclear which removable storage media will dominate. In addition, the use of direct electronic distribution of software will result in a whole new area of skills being required by those involved in its publishing and distribution. There is also a continuing realisation that in an industry where the 'hard' products are becoming ever more commodity-like, there is a need to find other ways of deriving value from the requirements of the end users.

In the computer industry, this trend has emerged in the form of hardware manufacturers becoming more and more interested in the 'content', i.e., the software and connected services, as opposed to the hardware itself. In the field of information storage, this trend is becoming visible as a shift from 'back-end' (storage media manufacturing) to 'front-end' (support services) provision for the consumer.

The view taken by Kao management as to the corporation's future in the field of information systems is one of acting as a bridge, or messenger between the clients (the software publishers) and the end users (of the software)[365]. The management of the Infosystems division realise that it is necessary for them to move further towards becoming a 'front-end' service provider. In the short- to medium-term the 'back-end' production of the consumables will continue to provide steady, if declining revenue[366]. A number of alliances have been formed which reflect this shift of emphasis, and these are discussed in later sections.

---

[365] Interview with Imamura, 18/3/96.

[366] Interview with Nakamura, 19/12/94.

Two examples of areas where Kao is providing front-end service are:-

• *Provision of 'call center' services*. These services provide a pan-European, multi-lingual customer support call-up service. A typical use for this service is illustrated through its use by a US computer manufacturer. When it was found that one of the US company's products had a fault, customers in Europe were given a toll-free number to call. These calls were then routed to Kao Infosystem's call centre, where advice in the language of the caller was given by Kao agents[367].

• *Customer data management*. This is a joint development with Hewlett-Packard to produce a software package which acts as an electronic registration screen. It is important for software publishers to gain as much information as they can about their customers. Traditional software registration cards have a very low return rate (typically around 20%), so if this customer information can be gleaned electronically via the Internet, it will add greatly to the software publishers knowledge of customer demographics[368]. The stage beyond that is to provide a software package that can interrogate the user's computer hard disk drive automatically[369]. Kao Infosystems range of services now reflect the balance of front-, and back-end user requirements, varying from project management to information management, and software replication to full 'turnkey services'.

Changing role for duplication plants

The role of a disk-based plant such as that in Huntingdon will have to change[370]. Kao management stress that they view the key role of the Huntingdon plant as one of "distribution and fulfilment to end-users"[371]. One Kao manager goes on to describe the way in which he sees the future for Kao Infosystems in the UK:-

> [..] the company will progress down the Internet route and, in parallel with that, people will be able to buy their software (or at least the basic 'building blocks') over the Internet. We intend to capture that information on behalf of the customer [software publishers]. We will build and maintain that database

367 *Communications Week International*, 22/5/95.

368 This service, named 'I-Reg' was launched in October 1996 (*PR Newswire*, 17/10/96).

369 Interview with Godfrey, 25/4/96.

370 Interview with Nakamura, 19/12/94.

371 Interview with Godfrey, 25/4/96.

> on behalf of customers [software publishers]. We will have shared ownership of that database to such an extent that we will only ship 'hard' copies of the software to those [end-users] who actually request it. [..] That is the path we are taking. I don't ever see 'hard' copy disappearing, but its volume will certainly be much diminished[372].

As stated earlier, Kao was able to enter the market for information consumables because the organisation was able to apply its skills in surface science to the manufacture of a range of products based on the coating of plastics with magnetic material. Around the time of the acquisition, the world production for floppy disks could not keep up with demand. As software grew ever more complex and space consuming, programmes that could easily be distributed on one 3.5 inch disk were being replaced by programmes that required between ten or twenty similar disks[373]. By applying principles of high quality, customer backup service and high volume international manufacturing capacity, Kao were able to dominate the market rapidly. However, the industry requirements for removable storage are now moving away from products based on such technologies. Kao's core surface science skills are required less and less as the trend shifts towards adding value through services. Kao has had to build a new series of skills, and the acquisitions seem to have been an efficient way of doing this[374].

Formation of alliances

To respond to the growing uncertainty of the removable storage market, and the shift away from 'hard' software distribution, the Infosystems division of Kao has formed a number of alliances in recent years. A number of the most significant of these are shown in Exhibit 8.9.

Partner	Date	Purpose
Cybersource	**1996**	Kao will gain access to Cybersource's secure electronic transaction processing and software distribution, in particular their 'Internet Commerce Services' package.
Microsoft	**1996**	Three year contract for Kao to produce "virtually all" of Microsoft's packaged products in North America.

[372] Interview with Godfrey, 25/4/96.

[373] Microsoft's Windows 95 operating system now requires twenty-four 3.5 inch disks (*Computer Reseller News*, 13/3/95).

[374] Interview with Imamura, 18/3/96.

DVD Beta Program	**1996**	Kao joined with Toshiba, Sonic Solutions and others to work on ways of ensuring the smooth transfer of DVD technology through to the consumer.
Personal Computer Buyers Club (PCBC)	**1996**	Kao acquired PCBC, a clearing house for personal computer makers, which markets consumer software and provides CD-ROM based marketing information.
Pacific Coast Sound Works (PCSW)	**1996**	Partnership with PCSW to provide studio facilities for 'content creators' based around the use of DVD technology.
DEC	**1995**	Kao joins with DEC to provide software duplication and packaging services. The aim is to combine Kao's duplication and logistics with DEC's software publishing arm.
WIN	**1995**	Kao to access to WIN's skills in pay-per-use multimedia to the consumer market.

Exhibit 8.9 Kao's alliances in the IT sector
Source: Data from FT Profile and Reuter Business Briefing

These acquisitions illustrate clearly the way in which the Infosystems division of Kao is moving away from 'back end' to 'front end' services.

Performance

Kao has managed to weather the worst effects of the Japanese economic downturn remarkably well, with both net sales and net income showing steady, if unspectacular growth over the past 10 years (See Exhibit 8.10).

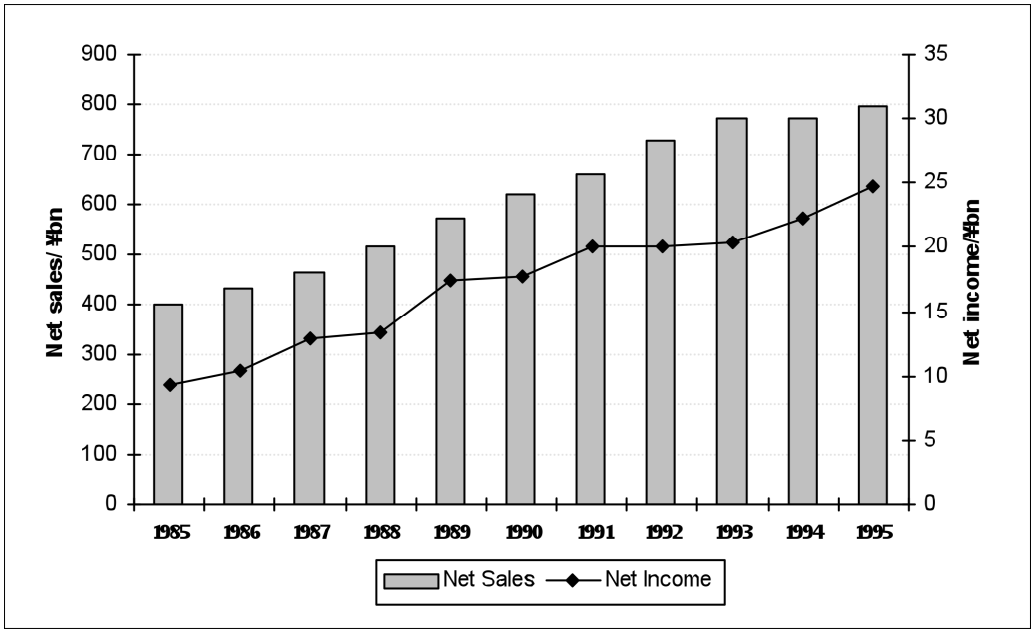


Exhibit 8.10 Kao's net sales and net income 1985-1995
Source: Company reports

Kao still derives over 80% of net sales from the domestic Japanese market and almost 90% from its core household products division. The Infosystems division has shown

remarkable growth, moving from a new market entrant in the removable data storage industry in 1985, to the worlds largest producer of floppy disks by 1992. As demand for the core products of the Infosystems division declines, it remains to be seen whether Kao will be able to maintain a lead in the software distribution market based predominantly on the provision of front-end services.

Closing comments

Despite a reputation for excellence within Japan, certain observers believe that Kao is not markedly different from other Japanese corporations, and that it too suffers from many of the commonly observed ills that are perceived to plague Japanese big business in the high technology industry (such as slow response to change, excessive bureaucracy and difficulty in integrating non-Japanese into the decision making process)[375]. Kao's anticipated threat to global competitors such as Procter & Gamble and Unilever never really materialised. Kao seemed unable to transfer its success in toiletries overseas. By setting up in a new industry sector, and using a product that required little local customisation, Kao was quickly able to develop a strong overseas presence with its Infosystems division.

The decision to locate the headquarters of the Infosystems division not in Japan, but in the US may have had implications that move beyond the motives expressed (i.e., "Information technology is the first truly global business for Kao, and it is being driven from the United States, where most of the customers are located"[376]). As one Kao Infosystems manager in the UK put it: "Kao Infosystems is not just a Japanese company". There may have been advantages in situating the headquarters (and the semi-autonomous decision making centre) of the Infosystems Division far away from Tokyo.

Despite the success of the tri-cultural (Europe, US and Japan) structure of Kao Infosystems division, praised by managers in the UK[377], there are those within the Kao

---

375 *The Economist*, 30/3/96.

376 John Depuy of Kao, as quoted in *Reuter News Service*, 17/8/94.

377 Interview with Godfrey, 25/4/96.

Corporation who do not see how the semi-autonomous off-shoot can feed back to Tokyo and help change the headquarters' thinking. The management style of Kao as opposed to that of Kao Infosystems division remains much less 'international' in outlook:

> Kao's unique management style may not fit well with American and European companies[378].

The formation of the Infosystems division of the Kao Corporation has allowed the Japanese corporation to take the first steps towards achieving a truly global presence. The Infosystems division of Kao has achieved remarkable successes world-wide in the short time since its formation. It remains to be seen whether the successful dynamics of the non-Japanese operations can be transferred to the core of the Kao Corporation in Tokyo[379].

[378] Anonymous Kao board member reported in *The Economist* 30/3/96.

[379] The recent transfer of the Japanese chairman and president of Kao Corporation of America, Toshio Hoshino, to the position of managing director of Kao Corporation, Tokyo, may be one move aimed at increasing the flow of knowledge back to the Japanese HQ.

Chapter 9 Discussion and conclusions

Chapter overview

In this chapter, the aim is use the case study data to provide one step in the process described by Eisenhardt (1989) of building an "incrementally more powerful" theory. By combining the case study material with the theoretical constructs provided by the resource-based view of the firm, an approach can be developed for viewing the behaviour of firms faced with a dynamic and uncertain environment driven by rapidly evolving technologies.

This chapter is divided as follows: Following a brief summary of the conceptual approach so far developed, the cases are discussed in terms of the Japanese firms developing a response to the changes in the computer industry which were being felt in the late 1980s. The most important of these was caused by the emergence of the PC which lead to the trend towards open systems based computing and the consequent redefinition of the structure of the computer industry. In response to this change, the acquisitions can be viewed as largely related to the acquisition of resources to help build competence in areas related to open systems based computing.

The case study acquisitions are then viewed with respect to the anticipated convergence leading to the formation of the digital industry. While at the time of the acquisitions, the impact of this convergence was not being directly felt to any great extent, it was becoming clear that issues relating to convergence could be of critical importance to the future strategies of the Japanese firms. In response to this anticipated change, the acquisitions can be related to the enhancement of capability, i.e., the gaining of skill in the organisational process of corporate acquisitions that would improve the firms' ability to compete in an uncertain and dynamic environment.

The next section draws together the ideas developed from the literature and the material collected from analysis of the case studies with respect to these two technological discontinuities, and presents a refined conceptual framework. Following this, we return to the question posed at the beginning of the thesis, and show how the building of this conceptual approach has provided us with a means for viewing the behaviour of firms in a fast changing and uncertain environment. In closing, suggestions for further work are made.

Introduction

The previous three chapters presented the 'basic story' of each of the case study acquisitions, describing the background of each company, the lead-up to the acquisition, and the events that followed. In this chapter, the aim is to apply this material to the conceptual approach so far developed to build up a broader understanding of the use of acquisitions by the Japanese firms. Certain readily apparent motives for the acquisitions can be easily identified from the case study material, and the theoretical underpinnings for these motives can be seen to be embedded in the mainstream literature on strategic management, the management of innovation and the management of acquisitions as reviewed in Chapter 3. For example, for Fujitsu, the acquisition of ICL represented a *defensive strategy* to prevent a valued alliance partner of some ten years standing being acquired by a third party.

When ICL's parent, STC, expressed interest in divesting itself of its majority stake in the UK firm in the late 1980s, Fujitsu risked losing a valuable partner in the UK if ICL's new owner proved to be less 'open to co-operation' than STC had been. Acquisition of the majority of ICL's shares was an effective strategy for ensuring the continued relationship between the two firms, though one which contained a level of risk. As discussed in Chapter 3, the act of acquisition of an attractive firm can actually destroy the firm's attractiveness[380]. However, by implementing an 'arm's length' approach to integration, and leaving ICL to function largely as an autonomous member of the Fujitsu Group, the relationship has been maintained. The acquisition of ICL by Fujitsu can thus be viewed simply as a *defensive, friendly/collaborative take-over* (Buono & Bowditch, 1989) implemented to protect an alliance partner.

With MELCO, in fulfilling the desire to become a player in the fast growing market for open systems based computers, they were faced with a problem of how to enter this dynamic and international competitive environment. MELCO needed to gain access to the appropriate skills. In terms of the technology strategies identified by Granstrand *et al.*

[380] E.g., if the target firm is attractive because of its highly motivated workforce, a change of ownership may result in the de-motivating of that same workforce.

(1992), MELCO was faced with a choice of internal development, formation of a joint venture, technology purchasing, technology scanning or the acquisition of a firm possessing the desired technology. While MELCO prided itself on "doing everything by itself", previous attempts to use internal skills to enter the international markets for small computers had not met with lasting success.

At the same time that MELCO was attempting to re-enter this market, changes were becoming evident in the Japanese approach to the use of corporate acquisitions. With the build-up of cash on corporate balance sheets caused by the booming Japanese economy coupled with the increasing desire of Japanese firms to 'internationalise', the previously unattractive option of using corporate acquisitions became a potential strategic tool MELCO could use. As these issues were being discussed in Japan, the manufacturing arm of one of the UK's most successful open-systems based computer companies was put up for sale. This seemed to present an ideal solution for MELCO's problem of how to enter the market for open systems based computers. MELCO was thus able to acquire not only the technology and other knowledge of how to make and market open systems based computers, but also to gain a manufacturing facility within the European Union for a product range with an established and respected brand image. MELCO's acquisition of the manufacturing arm of Apricot can thus be viewed in part as a *technology acquisition strategy* (Granstrand *et al.*, 1992) and also as a *related diversification through acquisition* (Johnson & Scholes, 1993).

For Kao, the acquisition of Protoscan represented one step in an on-going strategy of *unrelated diversification through acquisition* (Johnson & Scholes, 1993) which aimed to leverage Kao's 'core science skills' into the potentially lucrative market for data storage media. The management of Kao had seen an opportunity presented by the growth of the market for open systems based computing. By applying their skills in surface science, Kao was able to enter the market by first producing the coatings for floppy disks, before moving on to the production of the disk themselves, and then the duplication of software onto disks. This process of *forward, vertical integration through acquisitions* had been implemented successfully in North America, and with the gradual uniting of European

markets, Kao management saw the need to have a presence within a member state of the European Union. Following a trawl of potential duplication plants in Europe, Protoscan was found to fit most closely with Kao's needs and was duly acquired.

Thus we can see that the motives for the acquisitions were clearly visible and represented the application of well understood strategic thinking. What has remained less visible is an understanding of the long term benefits that the Japanese firms have been able to gain from acquiring ownership of the UK firms that counteracted the high risk and complex managerial issues presented by the integration of cross-border acquisition. The conceptual framework, developed using material from case studies upon the foundations of the *a priori* constructs drawn from the literature on resource-based view of the firm provides us with a means of viewing the acquisitions that encompass consideration of changes in the competitive environment, and links these changes with the development of appropriate business processes to respond to these changes.

Examination of the case study material quickly reveals one underpinning factor which is important from the standpoint of building the conceptual framework. The firms were not simply facing the emergence of a new technology which they needed to internalise, they were facing two *technological discontinuities*[381].

The first of these discontinuities was the result of the emergence of the PC and the subsequent changes that this caused on the structure of the computer industry. The second was the anticipated convergence of the computer, consumer electronics and telecommunications industries to form the 'digital industry'. The firms were not simply facing the emergence of a new technology which they needed to internalise, but the radical re-structuring of the competitive environment which would require firms to possess a high level of organisational flexibility and adaptability. Analysis of the case studies with respect to these two discontinuities, using the resource-based constructs (See Exhibit 9.1), provides us with an alternative perspective on the use of acquisitions, and

381 "Technological discontinuities are those rare, unpredictable innovations which advance a relevant technological frontier by an order-of-magnitude *and* which involve fundamentally different product or process design", (Burgelman *et al.*, 1996: 190).

leads to the refinement of the analytical approach for viewing the behaviour of firms faced with a dynamic and uncertain environment.

Core resources The store of tangible and intangible *firm specific* resources that the firm has internalised. Such resources include in-house knowledge of technology, skilled personnel, brand names and contracts.
Complementary resources The additional resources which may be required to be combined with certain core resources to form a competence. Such resources may include sales, distribution, complementary technologies or competitive manufacturing facilities.
Competences The ways in which resources are bundled together to form specific and distinctive skills areas.
Capabilities The routines or processes which allow the firm to reconfigure its resources. These include resource concentration, accumulation, complementing, conserving and recovery.
Competitive environment The influence of competitive pressures in the firm's external environment will influence how rapidly and in what way the firm must reconfigure resources.
Path dependencies A firm's previous investments and activities will, to a certain extent, restrict its behaviour. Attempts to reconfigure and adapt resources will naturally tend to close in on previous successful activities.

Exhibit 9.1 Core constructs of the resource-based perspective
Source: Adapted from Wernerfelt, 1984; Teece, 1986; Prahalad & Hamel, 1990; Stalk *et al.*, 1992; Teece *et al.*, 1992

These six constructs provide a language for describing the behaviour of the case study firms. In particular, they focus attention upon the way in which firms are able to acquire, augment and adapt resources to form new competences, and how they are able to enhance their capability to do so in order to pre-empt or react to change in the future.

In the following sections, the cases are analysed in terms of these constructs, firstly with respect to the emergence of open systems based computing, and secondly with respect to the anticipated effects of convergence.

Technological discontinuity 1: The emergence of open systems based computing

Nature of the open-systems based computer industry

As discussed in Chapter 2, a series of upheavals have punctuated the development of the computer industry. The 1950s saw the development of the mainframe computer, in the 1960s, the mini-computer had emerged, and the 1980s saw the arrival of open systems based computing. Concurrent with this third upheaval, wide reaching changes were taking place which were affecting a range of markets and industries. A new competitive environment for firms was being created, driven by three forces: intense international competition, fragmented markets and sophisticated customers, and diversified and transforming technologies (Clark & Fujimoto, 1991).

The nature of the products and services upon which this 'new', open-systems based computer industry was built forced changes in the strategy of the existing computer firms and gave opportunities to new firms to exploit market opportunities. The products of the new industry were typified by four main characteristics: open, systemic, rapidly changing and international.

These four characteristics of the products of the open-systems based computer industry also provided an opportunity for a wide range of service providers, such as all those offering services included under the umbrella of 'systems integrators'. As hardware and software from a wide range of companies was being put together to form IT solutions for businesses, the systems integrators were able to profit from the relative weakness of the consumer when faced with a varied and rapidly changing and growing range of hardware and software products.

This environment presented a paradox for firms. In some ways it favoured the small, nimble firm which is able to respond rapidly to signals from the market, or to apply emerging technologies into niche opportunity areas (Mills, 1996). In other ways, it seemed to favour the large firm, able to operate on an international level and maintain a wide portfolio of resources which could be leveraged into opportunity areas as and when they emerged.

This new competitive environment presented many challenges for firms shifting from the 'old' computer industry, or from unrelated industries, into the 'new' computer industry. To compete effectively required more than just accessing the relevant technologies: it required organisational capabilities that would allow the firms to respond to the dynamic, uncertain and international nature of this new competitive environment.

In the following sections, the case study acquisitions are discussed in terms of the key constructs of the resource-based perspective to examine the behaviour of the Japanese firms at the time of the technological discontinuity that marked the emergence of the open-systems based computer industry of the late 1980s and early 1990s.

Case A: Fujitsu and ICL

As "Japan's IBM", Fujitsu suffered the same problems that were facing the majority of the large computer producers in the late 1980s. The growth of the market for PC-based computing had taken these firms by surprise, and they were being forced to find ways to adapt to the changing competitive environment. In Japan, the uptake of open systems based computing was slower than in the US and Europe, but was nevertheless forecast to have a major impact in the near future. Fujitsu therefore needed to develop competence in this area if it wished to remain a major force in computing as the demand for the company's core computing product, the mainframe, declined. Fujitsu was not entirely reliant on computing, having well-established additional competences in telecommunications systems and electronic devices. Despite this, Fujitsu was still determined not to be left behind as the computer industry transformed itself.

Fujitsu's entry into the open systems based computer industry was hindered in part by its history, or its path dependencies. Fujitsu had always seen itself very much a technology-based firm. It saw its skills as resting in the pushing of technology to markets rather than responding to the needs of markets. This can be illustrated by its relative lack of success in marketing the 'FM-Towns' home-use PC, which represented a leap forward in technology, but was too advanced for the needs of the consumer at that time. The resources it had accumulated over the previous decades, and the capabilities it had for

reconfiguring these resources had provided it with a very different set of skills to those required within the open-systems based computer industry. The competence the firm had gained in mainframe computing in a way acted as a rigidity which hindered Fujitsu's ability to respond to the changes caused by the new technologies. The firm had also developed its computing competences predominantly within the domestic Japanese market, working largely with Japanese corporate customers for the big computer systems. Honing their competence in the production of market leading mainframe computers had not provided Fujitsu with the skills needed to compete in the highly volatile, high volume, international market for small computer systems. Fujitsu did have access to a number of the resources required for the development of open systems computing, such as memory chips, monitors and disk drives, but lacked others, such as open systems design skills, appropriate international marketing and distribution, and international manufacturing capacity.

The open system design resources that Fujitsu required to allow it to compete on an international level within the 'new' computer industry were skills in the design of the client machines (open architecture PCs), servers (UNIX workstations and very high performance PCs), and associated software. In addition, it was clear that as the PCs and related products became increasingly generic in nature, with competition increasing and margins reducing, success would fall to those firms who were able to maintain large scale production capacity and associated distribution on an international scale. Although products were becoming hard to differentiate in terms of technology, there was still a need for an appropriate brand to be presented to the consumer. Fujitsu thus needed the complementary resources of an international manufacturing capacity and distribution network, and a suitable brand image for non-Japanese markets.

Faced with this situation, Fujitsu needed to find a way to build competence and to access complementary resources that would allow it to compete in the open-systems based computer industry. The company's long standing partner in the UK, ICL, provided one source of the resources that Fujitsu lacked.

ICL had transformed itself throughout the 1980s from a highly vertically integrated IT product-based company, into a leading developer of open systems technology and IT services. Fujitsu's collaboration with the UK firm, built around the provision of the resource of core mainframe technology in return for the use of ICL's distribution network in Europe, had given the Japanese firm a good understanding of the strengths of the UK firm. Fujitsu needed to have access to ICL's open systems competence and related complementary resources, and was eager to strengthen ties. When ICL's parent, STC expressed its desire to divest itself of the UK firm, Fujitsu saw the threat that ICL (its source of resources to allow the development of competence in client-server computer systems) could be pulled away from its grasp. Acquisition provided one means to ensure that access to these core and complementary resources was maintained and internalised.

Through the acquisition, Fujitsu was thus able to acquire access to the resources of open systems design skills, international marketing and distribution skills, and international manufacturing capacity. The long relationship with ICL and the trust shown towards ICL's management by the Japanese had lead to Fujitsu handling the acquisition integration in a very 'hands-off' way. By successfully integrating the acquisition, Fujitsu was also able to enhance its organisational capabilities, in particular the ability to accumulate resources from external sources. Having learnt many lessons from the process of integration, Fujitsu would be able to apply these to any future acquisitions.

Case B: MELCO and Apricot

MELCO's attempts to enter the PC market in the early 1980s had achieved varied degrees of success. Despite beating IBM to produce the world's first 16-bit PC, MELCO's PC business had suffered a number of problems and they had withdrawn from this area before the end of the decade. It became clear that internally they lacked the required resources, or the required organisational capabilities, to be able to develop competence in PCs.

However, the PC market and trend towards client server computing was developing fast. To be unable to compete in this market, other than in the provision of resources in the

form monitors and memory chips to other firms seemed to be missing a valuable opportunity.

MELCO, like Fujitsu wanted to gain competence in the design, production and sale of open systems hardware and software in order to reposition itself within the open systems based computer industry. Doing so would also provide MELCO with one means to break out of its heavy reliance upon the domestic Japanese markets.

MELCO was a technology-based firm whose competences in propulsion systems, industrial automation equipment and satellites developed largely within the Japanese market had given it a very different set of skills to those required to compete within the market for open systems based computers. The vast array of resources which gave MELCO its competences in such a wide range of product areas had not proved sufficient, or at least had not cross-fertilised to help provide MELCO with some of the skills needed to compete in the international markets for small computer systems. Its failure to diffuse the know-how gained from its consumer electronics division can be taken as one indicator of how it lacked organisational flexibility and adaptability. It can be seen that faced with the changes in the computer industry, MELCO lacked certain capabilities, i.e., it lacked the ability to reconfigure its resources effectively to respond to the demands of the open systems based computer markets. This factor was in a way the result of the rigidities imposed by the previous activities of the firm. The competences that MELCO had developed in the markets for heavy electrical machinery, and even the skills in larger computers could be regarded as rigidities which hindered the development of competence in open systems based computing.

In order to develop competence in this area, MELCO required access to the core resources of skills in the design of the client machines, servers, software, large scale international production and distribution capacity and an appropriate brand. MELCO thus needed the complementary resources of an international manufacturing capacity and international distribution network and a suitable brand image for non-Japanese markets. Certain required complementary resources MELCO had already internalised, such as

those the firm held in electronic devices, monitors and disk drives.

Unlike Fujitsu, for MELCO there was no one partner who seemed to fill the role that ICL had done for Fujitsu in providing access to the required core and complementary resources which together would form competence in client server computing.

At the time that MELCO was standing on the side-lines of this changing environment, Apricot Computers in the UK announced that they were seeking to divest themselves of their hardware division. The management of Apricot realised that the future profits of client-server computing lay in the provision of services, and that hardware would only make money if produced in high volume on an international level. MELCO saw the opportunity that this divestment presented to them, and were keen to gain access to Apricot's hardware production resources. However, MELCO had never before attempted the take-over of a non-Japanese firm. In the past, MELCO had relied heavily on their diverse product groups to provide all the resources needed to develop a required competence. Acquisition was a step into the unknown for MELCO, and the suggestion was met with resistance internally.

MELCO's history to a large extent dictated its unsuitability to compete in the open systems based computer industry. The resources needed to develop competence in the production and sales of heavy electrical machinery had been very different from those needed to compete in the new computer industry. Also, despite having developed competence in the development and sales of consumer electronics (which should have provided resources useful for the marketing of home-use computers), MELCO lacked the organisational capability to combine and adapt these resources with those from its IT division.

By taking the bold step of acquiring Apricot, MELCO was able not only to access resources but also to enhance its organisational capabilities. The task of integrating the acquisition was not an easy one, as was seen in the problems faced during joint product development projects. How much MELCO has been able to learn from these problems will be one indicator of how effectively it has enhanced its capabilities.

Case C: Kao and Protoscan

Kao had seen the opportunities presented by the growth of the IT industry fuelled by the emergence of the PC in client-server and home-use markets. Kao was able to apply its competences in surface sciences to one of the many systemic products that made up the industry - the floppy disk. Having found that it could reconfigure its resources to provide the raw materials for other disk producers, Kao began to see the potential gains to be made in being a vertically integrated producer of disks. However, Kao also realised that in order to be successful in this market, a global presence was required. In addition, it was becoming clear towards the end of the 1980s that the future of the floppy disk was relatively limited. The speed of development of PCs meant that increasing amounts of storage capacity were required. While the market for removable storage would continue to grow, the use of floppy disks for software distribution was predicted to decline as programmes became larger and alternative forms of storage and distribution became available. If Kao wished to compete in this market, it needed to develop, or access, the required complementary resources to develop coverage of international markets quickly.

Kao had already acquired a number of firms in North America, and needed to strengthen its position within Europe. A search of potential targets revealed that Protoscan had certain resources that Kao needed, in the form of disk duplication services and a good range of industry contacts around Europe. By acquiring Protoscan, Kao gained the resources it lacked to allow it to continue to grow as a major player in the floppy disk and software duplication markets.

In addition, as the structure of the market for software distribution altered, Kao was in a position where it could access a wide range of resources based on the emerging technologies and services. The then emergent technology of CD-ROM for software distribution and the growth of software publishing related services such as disk duplication and packaging represented potential areas of future growth, but these were in areas in which Kao had no expertise. What Kao needed, and was able to gain through acquisition, was access to the ‘soft’ knowledge resources of firms already well established in the industry.

Summary of key issues

All three Japanese firms were able to develop competence in business areas related to open systems based computing through the use of acquisitions. Each one of the target firms was able to provide their new parent with access to a particular resource or collection of resources. The Japanese parent was able to combine these with existing internal resources to form the required competence that would allow them to enter or strengthen their positions within the competitive environment of the new computer industry.

In each case, the Japanese parents had been unable to develop these resources themselves, for reasons related to the rigidities imposed by their histories (their path dependencies) in combination with the competitive environment dictated by the dynamic nature of the open systems based computer industry. This had resulted in each of the Japanese firms being unable to react in a manner which would have allowed them to develop the competence internally.

Also, by acquiring, the Japanese firms were able to enhance their ability to augment their resources from external sources in future. Thus, it can be viewed that the acquisitions not only provided the Japanese parents with access to the resources to develop a competence, but also enhanced their capability to do so again in the future. With the convergence of IT, consumer electronics and telecommunications on the horizon, this may have been one of the most beneficial elements of the acquisition for the Japanese firms.

Technological discontinuity 2: The digital industry

The nature of the digital industry

The factors leading to the anticipated formation of the digital industry were discussed in Chapter 2. At the time of the lead-up to the case study acquisitions, the influence of this convergence could only be guessed at. However, it was clear to IT firms that such convergence, if and when it occurred, would present a highly complex and uncertain competitive environment. Consequently, as firms were unable to anticipate what lay beyond this technological discontinuity, they aimed to prepare themselves for change.

While certain aspects of the world that lay beyond the technological 'warp'[382] were making themselves felt at the time of the acquisitions, such as the trend towards client-server computing and the widespread diffusion of PCs among home and work locations, much of what lay beyond was highly opaque. All that was clear was that attempting to compete effectively in this environment would require the development or acquisition of certain organisational skills. Such skills include the ability to operate flexibly (to allow them to adapt to rapidly changing conditions), openly (to be able to manage alliances skilfully) and with an international outlook (to be able to operate in global markets).

In the following sections, the case studies are discussed in relation to three issues linking the potential effects of convergence with the behaviour of the firms:

- Firstly, around the time of the acquisitions, the Japanese firms could see convergence on the horizon, but could not necessary see how effectively they could, with the competences they had developed in the years prior to the acquisition, compete in that uncertain environment. By entering the market for open systems based computers, this would put them in a more advantageous position to prepare for the anticipated convergence leading to the formation of the digital industry. What they required was a 'carrier competence' to get them out of their present situation in relation to technologies and markets, and reposition themselves within the open-systems based computer industry (See Exhibit 9.2). It would put them, in affect, closer to the technological 'warp'.

[382] A term used by the Director of Interactive Services at ICL to describe the sense of uncertainty presented by convergence: "I felt like Captain Kirk looking at the big screen and seeing a 'warp' approaching. Beyond that 'warp' is a world of pervasive networking and multimedia services the like of which people had imagined to be possible" (Interview with Davison, 28/2/96).

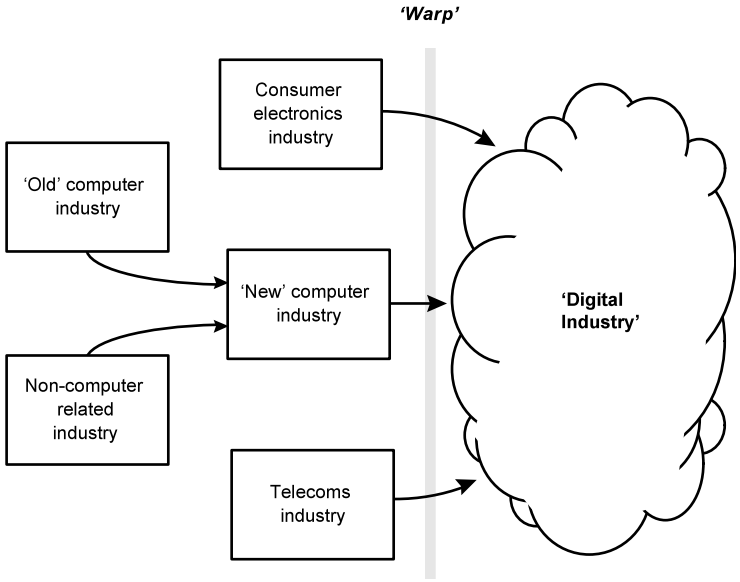


Exhibit 9.2 Positioning to prepare for convergence

- Secondly, having a subsidiary firmly positioned within the open-systems based computer industry meant that each Japanese parent was able to access a wider range of resources and knowledge through the subsidiaries' suppliers, customers and partners. Whereas with looser alliance partnerships, access to a partner's resources could be extremely limited, by acquiring, the parent gained access to effectively all of the subsidiaries resources (See Exhibit 9.3). For example, ICL's connections with the British Broadcasting Corporation (BBC) potentially gave Fujitsu access to a vast content resource.

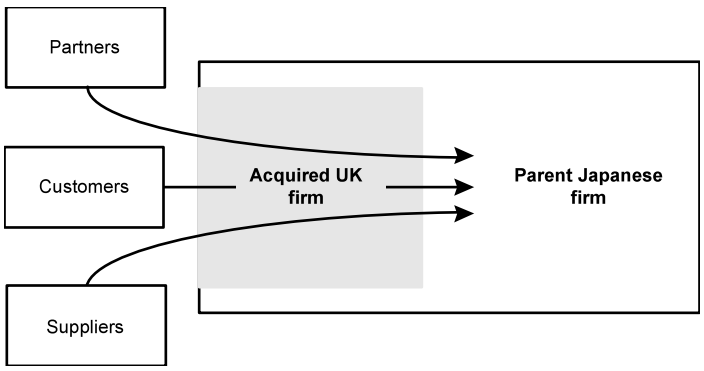


Exhibit 9.3 Accessing third-party resources through acquisition

- Thirdly, as discussed earlier, it was recognised that competing effectively in the digital industry would require a set of organisational capabilities that would allow a given

firm to be flexible, open and international in outlook. Of key importance among these capabilities would be the capacity to work with external companies, to form alliances and, if necessary, to acquire ownership of a firm. As has been stressed throughout this thesis, the act of integrating an acquisition is fraught with difficulty, and in the majority of cases, will result in failure. For Japanese firms, based in a system of corporate governance where acquisitions are a rarity, to lack capabilities in this area when attempting to compete in fast changing environment, such as that presented by the digital industry, could be a major disadvantage.

Each of the case study acquisitions is now briefly discussed from a resource-based perspective in terms of these three issues.

Case A: Fujitsu and ICL

Carrier competence

By acquiring ICL, Fujitsu was able to gain access to competence in client server technologies and the complementary resources to allow the Japanese firm to compete in the open-systems based computer industry on an international level. ICL's skill in open systems hardware and software provide the necessary 'carrier competence' to bring Fujitsu forward into this new competitive environment. Acquiring ICL, a firm which had built up strengths in open systems based computing and was transforming itself into an integrated service provider, Fujitsu was repositioned advantageously to prepare for the formation of the digital industry.

Wider access to resources

Once ICL was within the Fujitsu family, the Japanese firm was able to access additional resources through ICL. Examples of this can be seen in the way in which Fujitsu was able to access the 'groupware' software that ICL had obtained by its own purchase of Nokia Data, and the way in which Fujitsu has now obtained a connection to the resources of the BBC through ICL. ICL is continuing to move into services and systems integration, and is seeking more ways to derive business from the *provision of information* rather than the *provision of products*. As the UK firm builds competences in this area, Fujitsu too will be

able to benefit from this. Fujitsu itself is seeking to gain competence in Internet related services, which it is doing by building up networks of alliances world-wide.

New organisational capabilities

As Fujitsu pushes further into the digital industry, using the stepping-stones of competence in open-systems and then Internet related services, it will need to form more alliances and it is likely that the need to acquire ownership of external firms will emerge. The capability to manage acquisitions that it has learnt through the integration of ICL will be invaluable in the future. The act of successfully integrating an acquisition can be regarded as an enhancement of Fujitsu's capabilities. It has provided a means by which Fujitsu is able to break away from certain organisational rigidities imposed by its history.

Case B: MELCO and Apricot

Carrier competence

Having failed to develop competence in open systems based computing internally, MELCO was forced to go outside to access the required combination of resources and complementary resources. In a similar way to Fujitsu and ICL, access to Apricot's resources allowed MELCO to develop the competence it needed to enter the open-systems based computer industry and thus reposition itself more favourably with respect to uncertain competitive environment presented by the convergence towards to digital industry.

Wider access to resources

Apricot's non-Japanese customer base and network of suppliers provided a valuable resource for MELCO. Being a company which for much of its 75 year history had been based in the production of heavy electrical machinery, and had prided itself on being able "to do everything by itself", MELCO was in many ways intrinsically ill-suited to the dynamic, open and international environment of the open-systems based computer industry, let alone the highly uncertain digital industry. By having a non-Japanese firm within the MELCO fold, MELCO was able to learn from Apricot's relationships with non-Japanese firms and customers. MELCO was able to use Apricot as a 'cultural filter' to allow the highly Japan-centric MELCO to work with companies in the US. For

example, Apricot's good relationship with Intel and Microsoft has been used to MELCO's benefit.

New organisational capabilites

Having never managed an acquisition before, much attention within MELCO was focused on seeing whether the acquisition would be a success. If MELCO was to be able to compete in the new dynamic environments of open-systems based computer industry and the digital industry, it could potentially need the capability to manage acquisitions. In that respect, the acquisition of Apricot served as a useful testing ground for such partnering and provided an opportunity to learn a new organisational capability. Whether, in integrating future acquisitions, MELCO will have the patience and show the level of trust towards other subsidiaries as they have towards Apricot remains to be seen.

Case C: Kao and Protoscan

Carrier competence

Kao was well aware that the carrier competence selected for bringing the firm into the open-systems based computer industry was one with a finite life. It was clear that new technologies would soon surpass the magnetically coated plastic disc. The Kao case in many ways illustrates most clearly how the Japanese firms were able to use a 'carrier competence' (in this case the floppy disk) to enter the open-systems based computer industry.

Wider access to resources

By using acquisitions, rather than the setting up of greenfield sites, Kao had been able to access not only the required complementary resources to allow the firm to become the world's leading producer of floppy disks, but also to access a wide range of resources that would be useful as the demands of the market changed. For example, as the use of CD-ROM's for software distribution grew, Kao needed to develop competence in this area. The acquisitions made by Kao in the US had provided the Japanese firm with many contacts with firms possessing resources needed for the formation of competences within the digital industry, such as resources to build competence in DVD and software distribution via the Internet. Kao's acquisition of Protoscan to a certain extent has added

to that access of a wide range of resources.

New organisational capabilities

Kao had used acquisitions consistently as a means to access resources and build its competence in floppy disk production, and then software distribution and support services. The management of the Infosystems division of Kao had realised that the technology selected as the carrier competence had a finite life, and consequently it was important for them to gain the required complementary resources as soon as possible. In addition, by acquiring North American and European firms, Kao was able to access a wide range of knowledge as to non-Japanese management skills. Though applying a strong hand in the integration of the acquisitions, Kao nonetheless learned a great deal from each of the acquisitions it carried out. These skills stood to serve Kao well as it entered the digital industry. As Kao shifts away from the production of removable storage into Internet related services and publishing services, such capability will stand the firm in good stead for competing in the dynamic, open and international world of the digital industry.

Summary of key issues

It can be seen that each of the case study acquisitions can be regarded as a method by which each of the Japanese parent companies accessed core and complementary resources to allow them to compete in some areas of the open-systems based computer industry. It can also be seen that the acquisitions have provided the Japanese firms with access to resources (as well as enhancing their *ability to access and reconfigure resources* in the future) that improve their potential to compete successfully within the uncertain, dynamic and international competitive environment that is predicted to characterise the digital industry.

Viewing the case study acquisition from a resource-based perspective has provided a means to consider the acquisitions in terms of strategy to respond to uncertainty. In particular, it has allowed us to view the acquisitions in terms of the acquisition of resources to develop competences, and the enhancement of capabilities to allow the firms

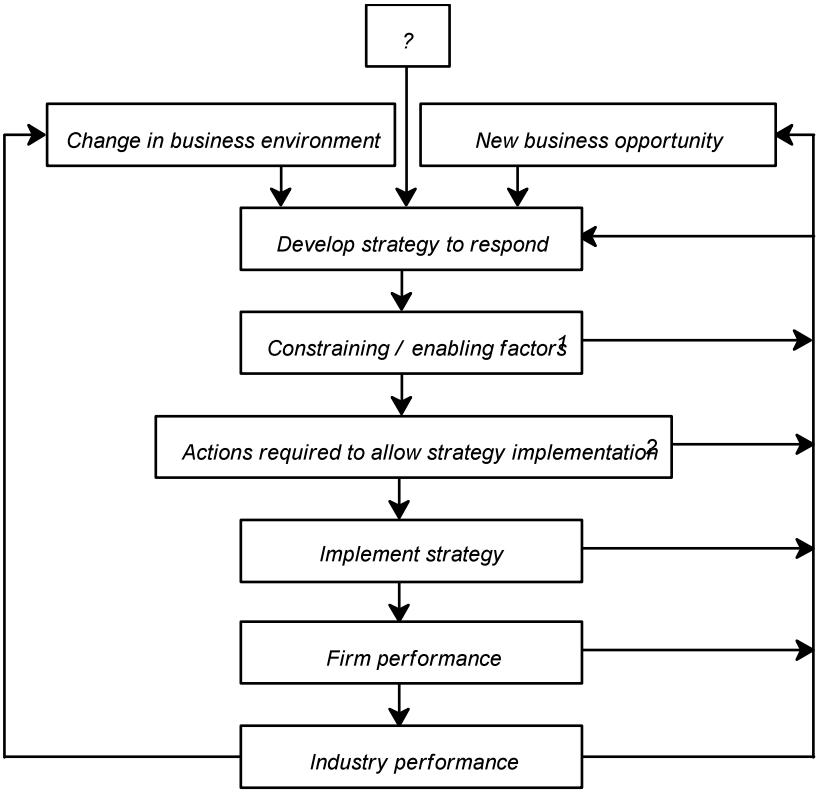
to compete in conditions of rapid change.

Refinement of the conceptual framework

Having examined the case study material from a resource-based perspective with respect to the two technological discontinuities, we can now return to build upon the foundations provided by the basic conceptual approach developed in Chapter 4.

From examination of the case study material, a number of weaknesses in the original conceptual framework built upon the constructs provided by the literature on the resource-based view of the firm (shown again in Exhibit 9.4) become obvious.

In viewing the actions of firms in such a manner, there is a weakness in the link between internal and external considerations. The framework is highly supply-side based, focusing on the internal processes within the firms without linking closely with the external industrial environment. As the case study material revealed, it was the nature of the changes in the competitive environment that was dictating the organisational processes and structures required by firms. Firms would require the ability to maintain a high level of responsiveness to change, and the resultant 'ideal' organisational form blurred distinction between internal and external considerations. Internalising a wide raft of redundant resources was inappropriate. What was needed was the ability to access resources (in whatever form) in a timely and efficient manner in response to the changes in the environment.



1 Factors include:

- Firm specific resources.
- Competences.
- Capabilities.
- Complementary resources.
- Competitive environment.
- Path dependencies.

2 Actions include:

- Stretching / leveraging resources.
- Reconfiguring resources to form new competencies.
- Acquiring / learning new ways to reconfigure resources.

Exhibit 9.4 Basic conceptual approach

In addition, the case study material revealed the importance of consideration of past, present and future factors. It can be readily seen from the case studies that the previous strategies and activities of the firms had a strong influence on their ability to react to changes in the competitive environment. Also, it was clear that the activities of the firms in response to changes in the competitive environment at the beginning of the 1990s would have an impact on their ability to respond to changes in the future. Combining consideration of factors such as these with the basic conceptual constructs of the resource-based perspective identified in Chapter 4, it now becomes possible for us to construct a framework for enhancing our understanding of the use of acquisitions by

firms faced with a dynamic and uncertain environment (See Exhibit 9.5).

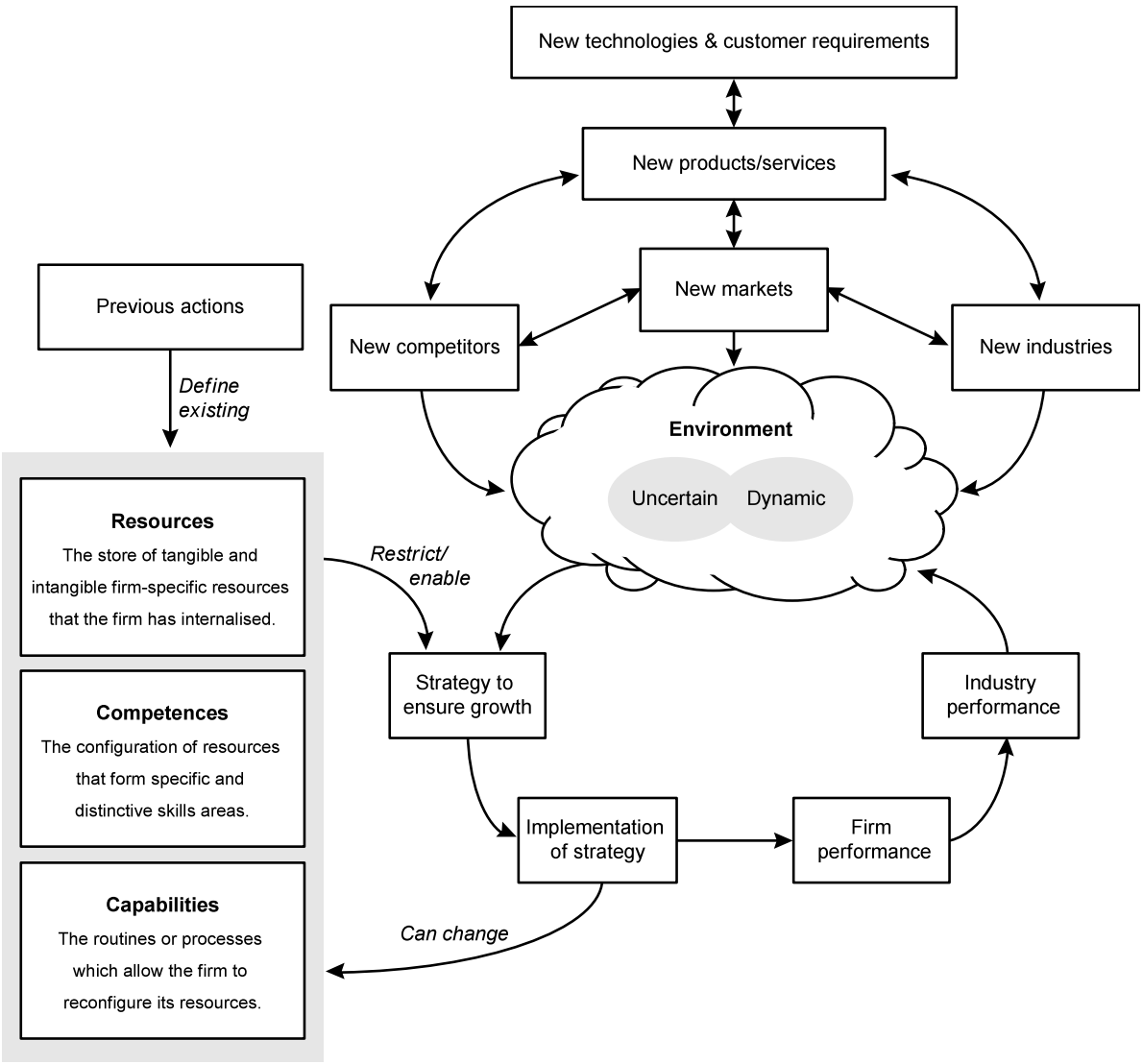


Exhibit 9.5 Refined conceptual approach

In this framework, we are viewing the emergence and demand for new technologies as the core driving force behind the conditions of uncertainty faced by firms such as those used as case studies for this research[383]. These new technologies will drive the development of new products and the emergence of new service sectors. These may result in the formation of new markets, alter the barriers to entry of existing markets and open

[383] There are of course a number of other factors which depending on the research perspective taken, could be equally considered as 'core' in forming environmental conditions of uncertainty. For example, the formation of trading blocks and the impact that this has upon the strategy formulation could equally be considered as the fundamental root of uncertainty for firms operating on an international level. However, this thesis is based around consideration of emerging technologies as the underlying key factor.

up the field to new competition. They may even result in the formation of complete new industries. The case of the PC industry illustrates this graphically. These factors interact to create a complex environment for firms in which to develop a strategy that will ensure continued growth.

Using the approach so far developed, the options open to the firm become dependent upon internalised, or accessible, resources, competences and capabilities. These resources, competences and capabilities are largely defined by the firm's previous activities, but can all be augmented by the implementation of an appropriate strategy. Viewing the behaviour of the firm in this way reveals the role acquisitions may play within a strategy to respond to a dynamic and uncertain environment. The use of corporate acquisitions allows a firm not only to access the resources of an external firm so as to form a competence, but also by successfully implementing the acquisition, to enhance the firms capabilities to do so again in the future.

This framework represents the result of applying the case study material to the original conceptual constructs drawn from the literature on the resource-based view of the firm. It represents one stage of the process of building incrementally more powerful theory from case study material (Eisenhardt, 1989), and provides us with a means to structure the analysis of the behaviour of a firm when faced with conditions of uncertainty, driven by fast emerging technologies.

Conclusions

The case studies have provided us with material for the development of a framework built around the constructs drawn from the literature on the resource-based view of the firm which allows the research question stated in Chapter 1 (*How have Japanese firms been able to benefit from the acquisition of UK IT firms to enhance their ability to compete in the complex and dynamic environment of the IT industry?*) to be addressed.

A starting point for the research has been an examination of the competitive environment facing the Japanese firms, or the relevant division of the firms, around the time of the acquisitions. Examination of the IT industry in the lead-up to the acquisitions in the late

1980s revealed a number of wide reaching changes of sufficient magnitude for them to be labelled as a *paradigm shift*. The root of this upheaval was the emergence of the open-architecture PC and the consequent linking of these machines to form the basis of client-server systems. The speed and spread of these changes caught many of the established computer manufacturers off-guard while at the same time providing opportunities for new firms to enter the market. The diffusion of the PC greatly increased the number of computer users world-wide and forced firms whose competences lay in the production of low volume, large and expensive computer systems to adapt rapidly.

Examination of the industry in the years that followed the acquisitions revealed another major upheaval that was beginning to impact upon the strategies of IT firm. The first effects of the much talked of *convergence* of the fields of consumer electronics, computing and telecommunications were beginning to be felt. The anticipated formation of the *digital industry* was starting to influence the strategies of firms and was redefining the structure of the separate industries. Instead of firms operating in largely discrete industries or industry sectors, the 'digitisation' of data and the development of new families of products made the boundaries between industries increasingly transparent. Firms were beginning to find themselves operating in an environment where the flexibility to respond to rapidly changing technologies, openness to work with firms from different industries and with contrasting cultures, and an international outlook and presence was vital.

Once this competitive environment had been examined, the next stage was to explore the literature to see where the areas of knowledge lay that might be able to explain the link between the use of acquisitions by Japanese firms and the changes in the competitive environment driven by emerging technologies. The first stage was to examine the literature on strategy, and in particular the connection between strategy in the face of change, and strategy and growth within a dynamic environment driven by rapid and wide-reaching technological change. The literature pointed to the ability of a firm to manage innovation effectively as being a key competent of a successful strategy to maintain growth in the face of such conditions.

Examination of this literature (relating to the firm's ability to manage innovation effectively in the face of a dynamic and uncertain environment) pointed to the importance of the ability of a firm to create, adapt or acquire knowledge and new technologies, and to integrate these effectively into the parent organisation. In order to access fast emerging technologies in the face of widespread and rapid change would often require the forming of alliances. However, this body of literature also revealed that the dynamics of effective innovation and alliance partnering are often incompatible, and may result in a 'fundamental tension' existing between these two elements of strategic management. At this point, it becomes evident that acquisition of ownership of a firm may provide many of the benefits of alliance partnering without a number of the difficulties.

However, while acquisition may be a preferred option from the standpoint of innovation in the face of a dynamic environment, the literature on acquisition management reveals a number of potential stumbling blocks, among the largest of these being the complex managerial challenges presented when attempting to integrate two different organisational cultures.

What was required for this research was a means of examining the behaviour of the firms in a more holistic way, which included consideration of the processes within the firm as well as the influence of the external industrial environment. The body of literature which provided a resource-based perspective on the behaviour of the firm provided such a means to analyse the behaviour of the firms.

Analysis of the literature emerging from the resource-based view of the firm revealed works that provided a plethora of terminology and an inconsistency of usage, but which nonetheless did provide a number of valuable theoretical constructs for linking analysis of the behaviour of firms with conditions in the environment.

The resource-based perspective provides us with the ability to view the firm in terms of its competences (the bundles of skills and technologies) and its capabilities (the way in which the firm is able to reconfigure its skills and technologies to form new competences). For this research, the resource-based perspective provided a number of

constructs which, when combined with the case study material, formed the basis of a framework for viewing the behaviour of the Japanese firms faced with a dynamic and uncertain environment. The framework allows us to combine consideration of the changes in the external environment with the development of the organisational processes to react to these changes.

Using this resource-based framework allows us to reach two concluding comments:

- Each of the case study Japanese acquisitions can be viewed in terms of the *acquiring of resources* and the *enhancing of capabilities*. The former refers to the internalising of skills, knowledge and technologies from an external organisation. The latter to the learning, or improving, of business processes to allow the organisation to be flexible to respond to change in the future.
- Each of the cases can be viewed in terms of changes that were happening at the time of acquisitions - the shift towards open system based computing - as well as in terms of the anticipated far reaching changes that would be the result of the convergence of computing, communications and telecommunications. The uncertainty presented by this loosely defined 'convergence' pointed to the need for firms to maintain flexibility and openness, rather than to remain closed and focus on internalising resources to hedge bets against the future.

Thus, through the development of the framework built upon the concepts drawn from the resource-based view of the firm, it can be seen that the Japanese firms benefited from the acquisition of ownership of the UK firms not only by accessing resources of immediate use, and also by enhancing the ability to access resources in the future.

Further work

Four possible directions for further work which would build upon the research described in this dissertation are outlined in the following sections (See Exhibit 9.6).

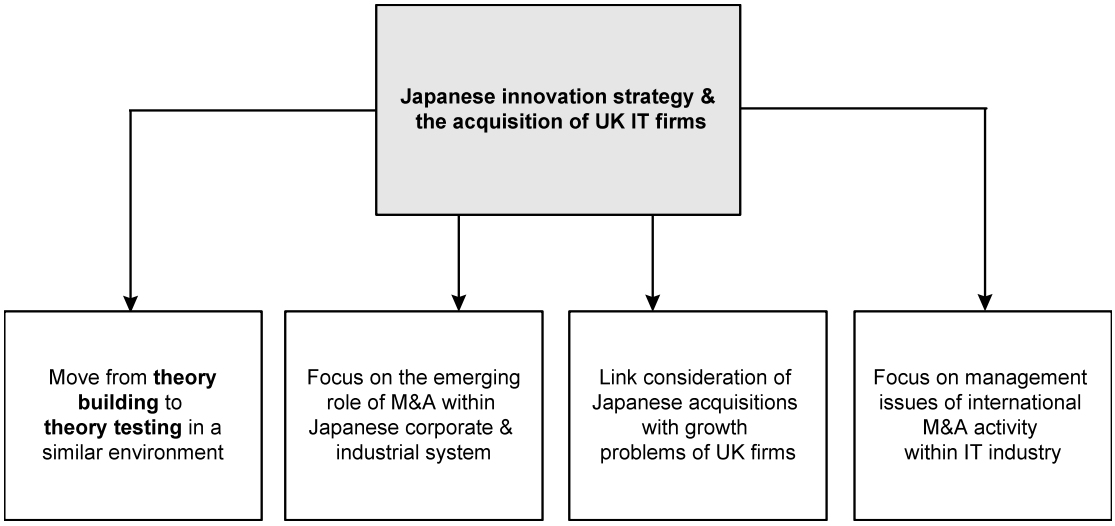


Exhibit 9.6 Options for further work

From theory building to theory testing

The research described in this dissertation has sought to use the principles described by Eisenhardt (1989) of combining conceptual constructs with evidence from cases studies to build "incrementally more powerful theory". A further iteration of this cyclical process of developing theory is to use the "accumulation of both theory building and theory testing empirical studies" (Eisenhardt, 1989:547). In this case, this second stage involves the application of the conceptual approach outside the restricted environment of the 'critical' case studies. The further application of what Yin (1994) describes "replication logic" provides a means to ascertain the 'usefulness' of the framework. It can be seen that the utilisation of the conceptual approach developed from this research in a wider range of cases will provide a means of determining the generalisability of this approach.

While this possible avenue for further work links closely with the approach taken so far, the following suggestions for further work tie-in the use of M&A with wider patterns of activity.

Evolution of the Japanese corporate and industrial system

An underlying determinant in forming the research question at the beginning of this thesis was the noted inexperience of many Japanese firms in the strategic use of international M&A. This inexperience has been identified as being linked to a number of factors (Kester, 1991). Among these, it has been well-documented that the nature of the Japanese

system of corporate governance does not encourage the use of international M&A. However, it is becoming clear that the institutional arrangements that have provided the structural foundations of Japan's corporate and industrial system (and the backdrop for the research detailed in this dissertation) may themselves be about to undergo a period of change. The much-trumpeted "Tokyo Big Bang", or restructuring of the Japanese financial markets has been predicted to have a potentially dramatic impact on the ownership structure of Japanese firms. While this restructuring has been talked about for many years, the administration of the present Japanese Prime Minister, Ryutaro Hashimoto, recently announced that it would seek to implement the changes that would allow the Japanese financial markets to become "free, fair and global" by the year 2001 (Keizai Koho Center, 1996). Such reforms, if implemented, could allow increased foreign ownership of Japanese firms, raise the likelihood of increased shareholder influence upon the strategies of Japanese firms and increase M&A activity *by* Japanese firms.

While some commentators have pointed out that these reforms have been promised for many years without any real action being taken, there are indications that initiatives are now being made, and that certain developments have been on-going for a number of years, 'behind the scenes':-

> Changing patterns of corporate finance are altering the crucial relationships with traditional suppliers of capital. At the same time, strategic restructuring is diversifying many large manufacturers. [..] Accompanying these developments have been several small but important changes in the Japanese market for corporate control. Some traditionally stable shareholders are showing signs of disloyalty to incumbent management and willingness to sell out for profit. [..] Even unfriendly foreign bidders are finding opportunities to acquire equity stakes in Japanese targets, and their threats are being taken more seriously. In short, there is a gradual movement towards a more open, Anglo-American style market for corporate control (Kester, 1991:6).

This would seem to point towards the development of a corporate environment whereby M&A becomes integral to the portfolio of strategic options open to Japanese firms in the same way it is to their Anglo-American counterparts. As such, the learning curve for the use of national and international M&A by Japanese firms, especially those in the rapidly changing high technology industries will have to be extremely steep. This presents a most interesting environment for research which could utilise the consideration of the use of

M&A to enhance competence and capability as developed in this thesis.

Growth of UK high technology firms

While the option for further research detailed above would build upon existing work and analyse elements of the increasing role of M&A activity among Japanese firms, an alternative would be to shift the focus of attention more to their potential international 'targets'. Research in this area would focus on combining consideration of the use of M&A to enhance competence and capability with growth problems facing UK high technology firms. In particular, attention could be devoted to analysis of the situation whereby fast-growing firms are unable to raise sufficient capital from 'patient' sources to ensure the maintenance of long term growth, and find themselves an easy target for acquisition. Linking in with the work of Shah & Garnsey (1993-4) it should be possible to develop the resource-based approach developed in this thesis to encompass study of certain short-comings of the UK system of corporate governance. Research effort could be directed towards consideration, from a resource-based perspective, of the situation where successful and growing firms are unable to raise capital to maintain their desired level of growth without their being a requirement to deliver short term profits for shareholders. Acquisition by an organisation with sufficient resources to provide capital for a fast-growing firm may prove to be an attractive option (albeit one that may affect the capacity for independent innovative development, uninfluenced by the parent's strategy).

Strategic use of M&A in the IT competitive environment

It has been illustrated throughout this research that the IT industry is at present undergoing a period of intense change. The convergence of IT, CE and telecommunications is leading to the formation of a highly uncertain and dynamic competitive environment. Within this environment, the pace of change and intensity of competition is leading to the proliferation of alliance formation and M&A activity: a recent survey revealed that an astonishing 72% of companies operating in the IT industry were planning to use M&A within the following 12 months (*Investors Business Daily*, 19/12/96). At the time of writing, M&A activity within the IT industry was at "record

levels", according to analysts (*Financial Times*, 1/2/96). Yet, is still seems that the management complexities that accompany the use of M&A for strategic rather than financial reasons are little understood. Failure rates remain high, and continue to be blamed upon a poor understanding of the intricacies of the post-acquisition integration process (Angwin, 1997). As much of this M&A activity reflects the international nature of the IT industry by taking place across borders, a deeper understanding of the complex management issues that are an integral part of the stratgic use of international acquisitions in a fast changing competitive environment is one that, particularly at present, requires further consideration.

References

Abegglen, J. C., & Stalk, G., 1985, *Kaisha: The Japanese Corporation*, Basic Books.

Alchian, A. A., 1950, "Uncertainty, evolution and economic theory" in *Journal of Political Economy*, 58.

Anchordoguy, M., 1989, *Computers Inc.: Japan's Challenge to IBM,* Harvard University Press.

Angwin, D., 1997, "The dynamics of post-acquisition integration", *Warwick Business School Research Papers*, Number 204.

Ansoff, I., 1987, *Corporate Strategy*, Penguin.

Apple Computer, 1993, as illustrated in "A survey of the computer industry" in *The Economist*, 27/2/93.

Argyris, C., & Schön, D., 1984, "Organizational learning" in *Organizations: Cases, Issues, Concepts*, 111-119, edited by R. Paton, Harper & Row.

Asahi News Service, 12/4/90, "Mitsubishi buys Britain's Apricot computer hardware division".

Asahi, 1993, *Japan Almanac 1993*, Asahi Newspaper.

Asahi, 1994, *Japan Almanac 1994*, Asahi Newspaper.

Asahi, 1995, *Japan Almanac 1995*, Asahi Newspaper.

Associated Press, 25/4/95, "Kenneth Wattman is eyes and ears for Japan's Kao executives half a world away".

Auerbach, A. J., 1988, *Corporate Take-overs: Causes and Consequences*, University of Chicago Press.

Bartlett, C. A., & Ghoshal, S., 1989, *Managing Across Borders: The Transnational Solution,* Century Business.

Bidault, F., & Cummings, T., 1994, "Innovating through alliances: experiences and limitations." in *R&D Management*, 24, 1.

Birmingham Post, 18/4/90, "Mitsubishi predicts success for Apricot".

Bowerdean, 1995, *Video games - a Business Review*, Bowerdean Publishing.

Bowonder, B., & Miyake, T., 1992, "A model of corporate innovation management: some recent high tech innovations in Japan" in *R&D Management*, Volume 22, No 4.

Bowonder, B., & Miyake, T., 1993, "Japanese innovations in advanced technologies: an analysis

of functional integration" in *International Journal of Technology Management*, Volume 8, Number 1/2.

Bryman, A., 1989, *Research Methods in Organization Studies*, Routledge.

Buono, A. F., & Bowditch, J. L., 1989, *The Human Side of Mergers and Acquisitions*, Jossey-Bass.

Burgelman, R. A., Maidique, M. A., & Wheelwright, S. C., 1996, *The Strategic Management of Technology and Innovation*, Irwin.

Business Week, 18/3/96, "Fujitsu gets wired".

Butler, C., 1995, "Kao Corporation" in *Organisation Theory: Cases and Applications*, edited by D. R. L., & M. P. Sharfman, West Publishing.

Campbell-Kelly, M., 1989, *ICL: a Business and Technical History*, Oxford.

Cartwright, S., & Cooper, C. L., 1990, "The impact of mergers and acquisitions on people at work: existing research and issues" in *British Journal of Management*, Volume 1.

Cartwright, S., & Cooper, C. L., 1992, *Mergers and Acquisitions*, Butterworth Heinemann.

Cawson, A., 1994, "Innovation and consumer electrics" in *The Handbook of Industrial Innovation*, edited by Dodgson, M., & Rothwell, R., Edward Elgar.

Chakrabati, A., Hauschildt, J., & Süverkrüp, C., 1994, "Does it pay to acquire technological firms?" in *R&D Management*, 24, 1.

Chandler, A. D., 1962, *Strategy and Structure: Chapters in the History of American Industrial Enterprise*, MIT Press.

Chesbrough, H. W., & Teece, D. J., 1996, "When is virtual virtuous?" in *Harvard Business Review*, January-February.

Chief Executive, 1995, "Building international agility", January.

Chposky, J., & Leonis, T, 1988, *Blue Magic: The People, Power and Politics Behind the IBM Personal Computer*, Grafton.

Clark, K. B., & Fujimoto, T., 1991, *Product Development and Performance*, Harvard Business School.

Clarke, K., Ford, D., & Saren, M., 1989, "Company strategy policy" in *R&D Management*, 19, 3.

Clarke, R., & McGuinness, T., 1987, *The Economics of the Firm*, Blackwell Publishers.

Communications Week International, 22/5/95, "UK: Call centers hit stride in Europe".

Computer Reseller News, 13/3/95, "The great floppy shortage".

Computer Weekly, 1/4/93, "The Far East, Nippon in bud: Japan's IT industry".

Computer Weekly, 16/11/95, "Japan: Sony makes new bid to enter PC market".

Computer Weekly, 2/8/90, "Government paved way for ICL deal".

Computer Weekly, 26/7/90, "Leak leaves Japan embarrassed".

Computer Weekly, 31/3/94, "Apricot boosts 'Shogun' with Japanese support".

Computergram International, 14/5/91, "Mitsubishi adopts Hewlett-Packard RISC".

Computergram International, 27/8/91, "Mitsubishi Electric may be in flux, but it's business as usual in matters of training".

Computergram International, 7/8/90, "Kao Corporation of Japan buys British floppy disk duplicator Protoscan Europe".

Computing, 21/1/93, "Japan: Mitsubishi axes mainframe work".

Cooper, R. G., & More, R. A., 1979, "Modular risk management: An applied example" in *R&D Management*, 9.

Cooper, R. G., 1984, "The strategy-performance link in product innovation" in *R&D Management*, 14, 4.

Costello, N., 1992, "Protoscan Software Services: structuration theory and social research", M.Phil. thesis, University of Cambridge, Judge Institute of Management Studies.

Cringely, R. X., 1992, *Accidental Empires*, Viking.

Cybert, R. M., & March, J. G., 1963, *A behavioural theory of the firm*, Prentice Hall.

Daily Express, 31/7/90, "Japanese invaders claim computer prize".

DataQuest, 13/6/96, "NEC acquires Packard Bell".

DataQuest, 14/8/95, "DataQuest predicts 32- and 64-bit video game hardware market to reach 18 million shipments by turn of century".

DataQuest, 19/7/94, "DataQuest predicts home PC boom".

DataQuest, 20/8/96, "DataQuest reports that consumer electronics semiconductor market has surpassed $24 billion".

DataQuest, 22/7/96, "DataQuest predicts semiconductor market to prosper with releases of DVD".

DataQuest, 29/4/96, "DataQuest forecasts world-wide PC market to grow 19% in 1996".

DataQuest, 9/5/95, "World-wide electronics to top $1 trillion in 2000".

Dore, R., 1973, *British Factory - Japanese Factory*, University of California Press.

Durlacher, 1994, "A survey of the video and computer game industry", Durlacher Multimedia.

Durlacher, 1995, "A survey of the video and computer game industry: ECTS update", Durlacher Multimedia.

Easterby-Smith, M., Thorpe, R., & Lowe, A., 1991, *Management research: An introduction*, Sage.

Eisenhardt, K. M., 1989, "Building theory from case study research" in *Academy of Management Review*, Volume 14, Number 4.

Electronics Weekly, 18/4/90, "Mitsubishi to boost Apricot plant output".

Electronics Weekly, 19/9/90, "Short-sighted hostility to Japan".

Electronics Weekly, 8/8/90, "Fujitsu targets ICL for Europe and US bid".

Elsass, P. M., & Veiga, J. F., 1994, "Acculturation in acquired organizations: a force-field perspective" in *Human Relations*, Volume 74, 4.

Emery, D., 1995, "A short history of ICL" from ICL WWW server (http://www.icl.com).

Emmott, B., 1992, *Japan's Global Reach*, Century.

Ferdows, K., 1993, "Why manufacture abroad: moving beyond the production benefits", *Georgetown University School of Business Administration Working Paper Series*, July.

Financial Times, 1/2/96, "IT mergers reach record levels".

Financial Times, 1/8/90, "Marathon ends on final green".

Financial Times, 10/11/93, "International company news: Fujitsu revises forecast down".

Financial Times, 12/4/88, "The Osaka shoemaker wants to go global: the growing Japanese enthusiasm for take-overs in the West".

Financial Times, 12/4/90, "Apricot concentrates on its core".

Financial Times, 14/2/95, "Samsung and NEC make virtue out of necessity".

Financial Times, 16/3/94, "More flexible less arrogant friend".

Financial Times, 18/10/90, "Survey of international M&A".

Financial Times, 2/10/96, "Key centre for developing new Internet devices".

Financial Times, 2/11/94, "Spark goes out of world-beaters".

Financial Times, 20/6/95, "Memory is power".

Financial Times, 20/9/91, "Survey of Japan in the UK: The lure of the open share market".

Financial Times, 22/1/96, "Drowning, not surfing".

Financial Times, 26/10/93, "Salvage task for metal man".

Financial Times, 27/7/90, "The ICL deal and Europe".

Financial Times, 30/3/91, "Apricot to start selling in Japan".

Financial Times, 31/7/90a, "STC goes back to basics".

Financial Times, 31/7/90b, "Japanese link promises 'bloody interesting future'".

Financial Times, 4/6/93, "Hard look at the soft option: Japan's big computer makers face a difficult road back to profitability".

Financial Times, 5/11/86, "ICL seeks partnerships as an alternative to merging".

Financial Times, 8/9/93, "International company news: Fujitsu cuts R&D to save costs".

Financial Weekly, 27/7/90, "ICL-Fujitsu deal destroys UK computer claims".

Financial Weekly, 3/8/90, "ICL-STC's shareholders should dig for the truth".

Florida, R., & Kenney, M., 1990, *The Breakthrough Illusion*, Basic Books.

Florida, R., & Kenney, M., 1993, *Beyond Mass Production*, Oxford University Press.

Forrest, J. E., 1991, "Models of the process of technological innovation" in *Technology Analysis and Strategic Management*, Volume 3, Number 4.

Fortune, 28/10/96, "Andy Grove welcomes Japan's inroads in PC market", as summarised in *Edupage*.

Fransman, M., 1990, *The Market and Beyond*, Cambridge University Press.

Fransman, M., 1994, "Information, knowledge, vision and theories of the firm" in *Industrial and Corporate Change*, Volume 3, Issue 3.

Fransman, M., 1995, *Japan's Computer and Communications Industry*, Oxford University Press.

Freeman, C., 1982, *The Economics of Industrial Innovation,* Pinter.

Fruin, W. M., 1992, *The Japanese Enterprise System: Competitive Strategies and Co-operative Structures*, Clarendon.

Garnsey, E. W., & Shah, S., 1993-4, "The acquisition of high technology firms: evidence from Cambridge", *Research Papers in Management Studies*, Judge Institute of Management Studies, University of Cambridge.

Garnsey, E. W., Alford, H., & Roberts, J., 1992, "Acquisition as Long-term Venture: Cases from High Technology Industry" in *Journal of General Management*, Volume 18, Autumn.

Gates, B., 1995, *The Road Ahead*, Viking.

General Magic, 1996, Data acquired from General Magic WWW server: (http://www.genmagic.com/).

Gerlach, M. L., 1992, *Alliance capitalism: The social organisation of Japanese business*, University of California Press.

Ghoshal, S., & Butler, C., 1992, "The Kao Corporation: A Case Study", in *European Management Journal*, Volume 10, Number 2, June.

Gilbert, X., & Strebel, P., 1988, "Developing competitive advantage" in *The Strategy Process: Concepts, Contexts and Cases*, edited by J. B., Quinn, H. Mintzberg & R. M. James , Prentice Hall.

Gomory, R. E., 1989, "From the 'Ladder of Science' to the product development cycle" in *Harvard Business Review*, November-December.

Granstrand, O., & Sjölander, S., 1990, "The acquisition of technology and small firms by large firms" in *Journal of Economic Behaviour and Organization*, 13.

Granstrand, O., Bohlin, E., Oskarsson, C., *et al*., 1992, "External technology acquisition in large multi-technology corporations" in *R&D Management*, 22, 2.

Gray, 1996, "Measuring the growth of the Web", MIT WWW site: (http://www.mit.edu/people /mkgray/growth/).

Gregory, M. J., 1995, "Technology management: A process approach" in *Proceedings of the Institute of Mechanical Engineers*, Volume 209.

Hall, P., & Preston, P., 1988, *The Carrier Wave: New Information Technology and the Geography of Innovation, 1846 - 2003*, Unwin Hyman.

Hamel, G., & Prahalad, C. K., 1993, "Strategy as stretch an leverage" in *Harvard Business Review*, March-April.

Hamel, G., & Prahalad, C. K., 1994, *Competing for the Future*, Harvard Business School Press.

Hamel, G., 1991, "Competition for competence and inter-partner learning within international strategic alliances" in *Strategic Management Journal*, Volume 12.

Hamel, G., Doz, Y. L., & Prahalad, C. K., 1989, "Collaborate with your Competitors - and Win" in *Harvard Business Review*, January-February.

Harvey-Jones, J., 1990, "Apricot Computers", in *Trouble-shooter*, BBC Books.

Haspeslagh, P., & Jemison, D., 1991, *Managing Acquisitions: Creating Value Through Corporate Renewal*, Free Press.

Hendeson, B. D., 1989, "The origin of strategy" in *Harvard Business Review*, November-December.

Herriott, R. E., & Firestone, W. A., 1983, "Multisite qualitative policy research: Optimizing description and generalizability" in *Educational Researcher*, 12.

Horwitch, M., & Prahalad, C. K., 1976, "Managing technological innovation: Three idea modes" in *Sloan Management Review*, Volume 17, 2.

Hu, Y. S., 1992, "Global or stateless corporations are national firms with international operations" in *California Management Review*, Winter.

Iansiti, M., & Clark, K. B., 1994, "Integration and Dynamic Capability: Evidence from Product Development in Automobiles and Mainframe Computers" in *Industrial and Corporate Change*, Volume 3, Issue 3.

Intel, 1993, as illustrated in "A survey of the computer industry" in *The Economist*, 27/2/93.

Investor's Business Daily, 12/6/96, "Where will DRAM woes lead Japan's chipmakers?".

Investor's Business Daily, 18/9/96, "Is Super Mario super enough to save tardy Nintendo 64?".

Investor's Business Daily, 29/5/96, "Why Zip Drive's recent gains haven't vanquished its rivals".

Investor's Business Daily, 6/5/96, "Will Zip Drive soon vanquish floppy disks?".

Investor's Chronicle, 3/8/90, "Fujitsu gets ICL".

Itami, H. and Numagami, T., 1992, "Dynamic interaction between strategy and technology" in *Strategic Management Journal*, Volume 13.

Japan Development Bank, 1995, "Problems concerning the international competitiveness of the electronics and electric machinery industry", *JDB Research Report*, Number 46.

Japan Economic Almanac, 1992, Nikkei Newspaper.

Japan M&A Quarterly, 1996, "M&A in Japan moves into a new phase", Summer.

Jebb, F., 1996, "ICL looks back in languor" in *Management Today*, July.

Jemison, D. B., & Sitkin, S. B., 1986, "Corporate acquisitions: A process perspective" in *Academy of Management Review*, Volume 11, 1.

JETRO, 1993, *White Paper on Foreign Direct Investment*, JETRO.

JETRO, 1994, *Access of foreign companies to the Japanese software market*, JETRO.

Johnson, G., & Scholes, K., 1993, *Exploring Corporate Strategy*, Prentice Hall.

Kao, 1995, "Special report: Virtual factory operation starts at Wakayama and Kyushu factories", in *Kao Internet Mycom Plaza*, Number 58, Summer 1995, as published on Kao's WWW server

(http://www.kao.jp.eng/online/mp/58/me583.htm).

Keizai Koho Center, 1996, "Structural reform of the Japanese financial market", translation of statement issued by the Japanese Prime Minister's Administration.

Kester, W. C., 1991, *Japanese Take-overs: The Global Contest for Corporate Control*, Harvard Business School Press.

Kish, R. J., & Vasconcellos, G. M., 1993, "An empirical analysis of factors affecting cross-border acquisitions: US-Japan" in *Management International Review*, Volume 33, Number 3.

Kitazato, K., & Trevedi, S., 1995, "The Fujitsu-ICL alliance: Synergy for competitive advantage", in *The Gyosei Journal*, Volume 1, Number 2.

Kitching, J., 1967, "Why do mergers miscarry?" in *Harvard Business Review*, November-December.

Kline, S. J., & Rosenberg, N., 1986, "An overview of innovation" *in The Positive Sum Strategy*, 275-305, edited by R. Landau & N. Rosenberg, National Academy Press.

Kodama, F., 1990, "Japanese innovation in mechatronics technology" *in Measuring the Dynamics of Technological Change*, 39-57, edited by J. Sigurdson, Pinter.

Kodama, F., 1991, *Analyzing Japanese High Technologies*, Pinter.

Kodama, F., 1992, "Technology fusion and the new R&D" in *Harvard Business Review*, July-August.

Kotler, P., Fahey, L., & Jatusripitak, S., 1985, *The New Competition*, Prentice-Hall.

Laurent, A., 1986, "The cross cultural puzzle of global HRM" in *Human Resource Management*, Volume 25, Number 1.

Leonard-Barton, D., 1992, "Core capabilities and core rigidities: A paradox in managing new product development" in *Strategic Management Journal*, Volume 13.

Levinson, H., 1970, "A psychologist diagnoses merger failures" in *Harvard Business Review*.

Lloyd's List, 9/3/96, "Restructuring hits ICL".

Magnetic Media Information Services, 1993, Data acquired for Kao R&D Division.

Martin, M. J., 1984, *Managing technological innovation and entrepreneurship*, Reston Publishing.

Maruyama, M., 1985, "Experience looping, design looping and concept crossing" in *Futures*, August.

Matsumoto, K., 1991, *The Rise of the Japanese Corporate System*, translated from Japanese by T. I. Elliott, Kegan Paul.

Matsuura, Y., 1995, "Japanese mergers and acquisitions in Europe", MBA project report, Warwick Business School.

McDermott-Brown, S., & Hargreaves, J., 1991, "Acquisitions and the human factor" in *Acquisitions Monthly*, August.

McMillan, C. J., 1985, *The Japanese Industrial System*, de Gruyter.

Meeks, G., 1977, "Disappointing marriage: a study of the gains from merger" in *University of Cambridge Department of Applied Economics, Occasional Papers,* Number 51.

MeGee, J., & Thomas, H., 1989, "Technology and strategic management: Progress and future development" in *R&D Management*, 19, 3.

MELCO PC History, 1991, Internal MELCO document, in Japanese.

Meyer, M. C., & Utterback, J. M., 1993, "The product family and the dynamics of core capability" in *Sloan Management Review*, Spring.

Miles, M. B., & Huberman, A. M., 1984, *Analyzing Qualitative Data: A Source Book for New Methods*, Sage.

Mills, D. Q., 1996, "The decline and rise of IBM" in *Sloan Management Review*, Summer.

Mintzberg, H., 1987, "Crafting strategy" in *Harvard Business Review*, July-August.

Mintzberg, H., 1989, *Mintzberg on Management*, The Free Press.

Mintzberg, H., 1994, *The Rise and Fall of Strategic Planning*, Prentice Hall.

Miwa, Y., 1996, *Firms and Industrial Organisation in Japan*, MacMillan.

Miyashita, K., & Russel, D. W., 1994, *Keiretsu: Inside the hidden Japanese conglomerates*, McGraw-Hill.

Miyazaki, K., 1995, *Building competence in the firm*, St. Martin's Press.

Morgan, G., 1986, *Images of Organization*, Sage.

Morris, C. R., & Ferguson, C. H., 1993, "How architecture wins technology wars" in *Harvard Business Review*, March-April.

Mujtaba, S. M. N., 1990, "Strategic analysis and the success of acquisitions" in *Acquisitions Monthly*, June.

Multimedia Week, 2/9/96, "Mitsubishi brings Motorola into the picture for integrated 'DiamondWeb PC-TV'".

Nahavandi, A., & Malekzadeh, A. R., 1988, "Acculturation in mergers and acquisitions" in *Academy of Management Review*, Volume 13, 1.

Napier, N., 1989, "Mergers and Acquisitions. Human Resource Issues and Outcomes: A Review and Suggested Typology" in *Journal of Management Studies*, May 1989.

Nelson, R. R., & Winter, S. G., 1982, *An Evolutionary Theory of Economic Change*, The Belknap Press of the Harvard University Press.

Network Wizards, 1996, from WWW site: (http://www.nw.com/zone/WWW/report.html).

Newsbytes, 18/4/96, "Belgium: European Commission confirms floppy disk taxes".

Newsbytes, 8/8/90, "Mitsubishi to boost workstation business".

Newsweek International, 30/7/90, "Fujitsu's growing empire".

Nikkei Business, 18/3/96, "This year: 'Intranets'", special feature, in Japanese.

Nikkei Japan Economic Almanac, 1992, Nikkei Shimbun.

Nikkei, 13/9/93, "Fujitsu charts strategy to end mainframe reliance".

Nikkei, 17/4/95, "Sega chief: Games industry poised for second wind".

Nikkei, 18/9/96, "Slump pushes chip makers to streamline".

Nikkei, 21/11/94, Fujitsu-Sharp union: Marriage or friendship?".

Nikkei, 3/10/96, "Battle taking shape over PDA operating systems".

Nikkei, 31/1/94, "NTT combs US for multimedia software".

Nikkei, 31/1/94, "Toshiba, Apple launch talks on 'Newton' alliance".

Nikkei, 31/10/94, "Real-life dramas tarnish Tinsletown dreams".

Nikkei, 4/9/96, "DVD role out quietly".

Nikkei, 5/11/96, "Samsung to ship 1-gigabit DRAMs for next year".

Nikkei, 7/11/94, "Video-game makers out to zap 32-bit rivals".

Nikkei, 8/10/96, "Lower price boosts demand for 64-megabit DRAMs".

Nonaka, I., & Takeuchi, T., 1995, *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press.

Nonaka, I., 1990, "Redundant, overlapping organization: a Japanese approach to managing the innovation process" in *California Management Review*, Spring.

Nonaka, I., 1991, "The knowledge creating company" in *Harvard Business Review*, November-December.

Ohmae, K., 1982, *The Mind of the Strategist: The Art of Japanese Business*, McGraw-Hill.

Ohsono, T., 1995, *Charting Japanese Industry*, Cassell.

O'Rourke, J. T., 1989, "Postmerger Integration" in *The Arthur Young Management Guide to Mergers and Acquisitions*, edited by R. S. Bibler, Wiley.

Osigweh, C. A. B., Huo, Y., & Huo, Y. P., 1993, "Conceptions of employee responsibilities and rights in the US and the PRC" in *International Journal of Human Resource Management*, 4:1.

Pannenborg, A. E., 1986, "Technology Push versus Market Pull - The Designer's Dilemma" in *Product design and technological innovation*, 175-181, edited by R. Roy & D. Wield, Open University Press.

Pascale, R. T., & Athos, A. G., 1986, *The Art of Japanese Management*, Penguin.

Pascale, R. T., 1984, "Perspectives on strategy: The real story behind Honda's success" in *California Management Review*, Spring.

Pavitt, K., 1991, "Key characteristics of the large innovating firm" in *British Journal of Management*, Volume 2.

Pavitt, K., 1992, "Some foundations for a theory of the large innovating firm" in *Technology and Enterprise in a Historical Perspective*, edited by G. Dosi, R. Giannetti & P. A. Tononelli, Oxford University Press.

Penrose, E. T., 1959, *The Theory of the Growth of the Firm*, Basil Blackwell.

Porter, M. E., 1980, *Competitive Strategy*, Macmillan.

Porter, M. E., 1985, *Competitive Advantage*, Free Press.

Porter, M. E., 1991, "Towards a dynamic theory of strategy" in *Strategic Management Journal*, Volume 12,

Porter, M. E., 1996, "What is strategy" in *Harvard Business Review*, November-December.

PR Newswire, 17/10/96, "Kao Infosystems launches I-Reg, (Integrated Registration) for customer focused marketing".

Prahalad, C. K., & Hamel, G., 1990, "The core competence of the corporation" in *Harvard Business Review*, May-June.

Prokesch, S. E., 1993 "Mastering chaos at the high tech frontier: an interview with Silicon Graphic's Ed McCracken" in *Harvard Business Review*, November-December.

Reich, R. B., & Mankin, E. D., 1986, "Joint ventures with Japan give away our future", in *Harvard Business Review*, March-April.

Reuter News Service, 1/4/96, "Japan: Mitsubishi Electric targets 1.2 million PC sales in 2000".

Reuter News Service, 11/3/91, "Japan: IBM Japan forms group to promote PC standards".

Reuter News Service, 17/8/94, "Japan's Kao diversifies into computer disks".

Reuter News Service, 17/8/94, "USA: Japan's Kao diversifies into computer disks".

Reuter News Service, 27/10/94, "Chip demand hauls up Japan electronics profit".

Roberts, E. B., 1987, *Generating Technological Innovation*, Oxford University Press.

Rosenbloom, R. S., & Christensen, C. M., 1994, "Technological discontinuities, organizational capabilities, and strategic commitments" in *Industrial and Corporate Change*, Volume 3, Issue 3.

Rothwell, R., 1992, "Successful industrial innovation: Critical factors for the 1990s" in *R&D Management*, 22, 3.

Santa Clara Consulting Group, 1992, Data acquired from Kao R&D Division.

Sasaki, N., 1990, *Management and Industrial Structure in Japan*, Pergamon.

Schein, E., 1985, *Organisational Culture and Leadership*, Jossey-Bass.

Schlosstein, S. B., 1989, "Japan" in *The Arthur Young Management Guide to Mergers and Acquisitions*, edited by R. S. Bibler, Wiley.

Schmidt-Tiederman, K. J., 1982, "A new model of the innovation process", in *Research Management*, 25.

Schoonhoven, C. B., & Jelinek, M., 1990, "Dynamic tension in innovative high technology firms: managing rapid technological change through organisational structure" in *Managing Complexity in High Technology Organisations*, edited by M. A. Von Glinow & S. A. Mohrman, Oxford University Press.

Schweiger, D. M., Csiszar, E. N., & Napier, N. K., 1993, "Implementing international mergers and acquisitions" in *Human Resource Planning*, Volume 16, 1.

Senge, P. M., & Sterman, J. D., 1992, "Systems thinking and organizational learning: Acting locally and thinking globally in the organization of the future" in *European Journal of Operational Research*, 59.

Senge, P. M., 1990, *The Fifth Discipline*, Century Business.

Senker, J., 1995, "Tacit knowledge and models of innovation" in *Industrial and Corporate Change*, Volume 4, Issue 2.

Senn, L., 1989, "Culture" in *The Arthur Young Management Guide to Mergers and Acquisitions*, 229-243, edited by R. S. Bibler, Wiley.

Sloan, A. P., *My Years with General Motors*, 1963, Sedgewick & Jackson.

Smothers, N. P., 1990, "Patterns of Japanese strategy: strategic combinations of strategies" in *R&D Management*, 11,

Soukop, W. R., & Cooper, A. C., 1983, "Strategic response to technological change in the

electronic component industry" in *R&D Management*, 13, 4.

Stacey, R. D., 1995, "The science of complexity: An alternative perspective for strategic change processes" in *Strategic Management Journal*, Volume 16.

Stalk, G., Evans, P., & Shulman, L. E., 1992, "Competing on capabilities: The new rules of corporate strategy." in *Harvard Business Review*, March-April.

Steele, A. P., Grant, E. B., Gregory, M. J., & Buckley, C., 1996, "International manufacturing transfer: developing a framework from empirical evidence", paper submitted to *Journal of Operations Management*, August.

Stewart D. W., & Kammins, M. A., 1984, *Secondary Research*, Sage.

Sun Microsystems, 1996, Data from WWW site (http://www.sun.com/corporateoverview/corp_overview.doc.figure.id.24.gif).

Tapscott, D., & Caston, A., 1993, *Paradigm Shift: the New Promise of Information Technology,* McGraw-Hill.

Tatsuno, S. M., 1990, *Created in Japan*, Ballinger/Harper and Row.

Teece, D. J., 1992, "Competition, co-operation, and innovation: Organizational arrangements for regimes of rapid technological progress", in *Journal of Economic Behaviour & Organization*, 18.

Teece, D. J., Pisano, G., & Shuen, A., 1992, "Dynamic capabilities and strategic management" in University of California at Berkeley working paper.

Teece, D., & Pisano, G., 1994, "The dynamic capabilities of firms: an introduction" in *Industrial and Corporate Change*, Volume 3, Number 3.

The Economist, 11/9/93, "The death of telephony".

The Economist, 13/8/94, "The world this week: Business and finance".

The Economist, 19/2/94, "Mission Mitsubishi".

The Economist, 24/8/96, "Preparing for prime time".

The Economist, 25/5/96, "The software industry".

The Economist, 3/2/96, "General Magic - Unintelligent".

The Economist, 30/3/96, "Should we kow-tow to Kao?".

The Economist, 9/8/86, "A strategy for success".

The Engineer, 23/9/93, "Fibre link tied in knots".

The Guardian, 17/8/90, "Shareholders back ICL sale".

The Independent, 4/8/90, "JESSi to review ICL partnership role".

The Independent, 6/8/90, "A marriage of convenience: Martin Campbell-Kelly examines the background and benefits of the take-over of ICL by Fujitsu".

Twiss, B. C., & Goodridge, M., 1989, *Managing Technology for Competitive Advantage*, Pitman.

Twiss, B. C., 1992, *Managing Technological Innovation*, Pitman.

Upside, 1995, "European high tech grows up", January.

Utterback, J. M., & Abernathy, W. J., 1978, "Patterns of industrial innovation" in *Technology Review,* 80.

Utterback, J., 1972, "The process of technological innovation within the firm" in *Academy of Management Journal*, 14.

van der Meer, R., & Gudim, M., 1992, "Competitive strategy in the market for microcomputers: Strategy and performance of the dominant firm" in *Managing organisations in 1992: Strategic Responses*, edited by Barrar, P., & Cooper, C. L., Routledge.

von Braun, C.-F., 1990, "The acceleration trap" in *Sloan Management Review*, Fall.

Wall Street Journal, 17/4/86, "Computer hardball".

Wall Street Journal, 8/11/96, "Egghead moves software sales to the Internet".

Warshawsky, M. J., 1987, "Determinants of corporate merger activity: a review of the literature", in *Federal Reserve Bulletin*.

Wernerfelt, B., 1984, "A resource-based view of the firm" in *Strategic Management Journal*, Volume 5.

Weston, J. F., Chung, K. S., & Hoag, S. E., 1990, *Mergers, Restructuring and Corporate Control*, Prentice-Hall.

Which Computer, 1988, "Product review", July.

Whittaker, D. H., 1990, *Managing Innovation*, Cambridge University Press.

Whittington, R., 1993, *What is strategy - and does it matter?,* Routledge.

Wilkinson, A., 1985, "Corporate strategy and the buying and selling of know-how" in *R&D Management*, 15, 4.

Wilkinson, A., 1987, "Corporate strategy as a source of ideas" in *R&D Management*, 17, 1.

Williamson, O. E., 1985, *The Economic Institutions of Capitalism*, The Free Press.

Windmill, R., & Mendelssohn, M., 1990, "Japanese acquisitions in Europe" in *Acquisitions Monthly*, Supplement, May.

Yamamoto, T., 1992, *Fujitsu: What Mankind can Dream, Technology can Achieve*, Translated by

Dick Belcher, Toyo Keizai.

Yin, R. K., 1994, *Case Study Research: Design and Methods*, Sage.

Yuzawa, T., 1994, *Japanese Business Success: The Evolution of a Strategy*, Routledge.

Appendix I Japan's industrial & corporate system

> Japan does not have an abundance of land or natural resources; neither can the qualities of the Japanese people be considered particularly outstanding. [..] One cannot say [..] that the Japanese are blessed with a superior intelligence, especially if one notes that even today, most of the basic creative advancements in science and technology come from North America and Europe. Rather than creative advances, it can only be said that the Japanese have generally been better at applying and improving them. In short, there are no convincing explanations for the tremendous development of Japanese industry to be found in either land, or natural resources, or in the diligence or intelligence of the Japanese people. *On the other hand, the Japanese corporate system is unique. [This suggests] that quite a strong argument exists for linking Japan's economic development to its unique corporate system* (Matsumoto, 1991:109, Emphasis added).

The aim of this Appendix is to describe the basic elements of this 'unique corporate system' which, along with the changes in the computer industry described in Chapter 2, provides part of the backdrop for this research.

Introduction

In the century following the beginning of the move from isolationism in 1868, Japan's economy has shown remarkable capacity for growth, adaptability and resilience (Yuzawa, 1994). Despite the almost complete destruction of the industrial infrastructure following defeat at the end of World War II, Japan has recovered and grown to be one the world's most powerful economic superpowers (See Exhibit AI.1 and AI.2).

The speed and resilience of this growth, overcoming the oil shocks of the 1970s, the doubling in value of the Yen in the 1980s and the collapse of the 'Bubble' economy in the 1990s has resulted in the generation of a large body of literature which attempts to 'explain the secret' of Japan's success.

As McMillan (1985) points out, attempts to rationalise Japan's success invariably tend to be grouped in one of three categories:-

> First, there is the cultural argument about the pattern of social values and institutions which give rise to consensus and group collectivism [..]. Second, there is the superman theory of the Japanese who, with very low defence expenditures and an overwhelming commitment to economic success, are creating an industrial superstate, egged on by a desire to be number one. [..]. A third view, [..] is that

the Japanese are applying textbook management principles in everyday work life (McMillan, 1985:3).

	Japan	USA	UK	Germany	France	Italy	Canada
1990	2932	5522	983	1496	1195	1095	572
1980	1036	2626	524	821	656	396	253
1970	197	974	120	187	149	94	84
1960	43	504	72	73	62	35	38

Exhibit AI.1 GDP at 1996 prices in G7 countries (US$ billion).
Source: Miwa (1996:4)

	Japan	USA	UK	Germany	France	Italy	Canada
1990	237	221	171	237	211	190	215
1980	89	115	94	133	122	70	106
1970	19	47	22	31	29	17	39
1960	5	28	14	14	14	7	21

Exhibit AI.2 Per capita GDP at 1996 prices in G7 countries (US$ billion).
Source: Miwa (1996:4)

As for the structure within which the Japanese firms operate, it remains unclear as to what impact this has upon the success factors:-

> [Japan's] remarkable growth and resilience raises fundamental questions concerning the nature of Japan's own form of capitalist economy. Put starkly: is Japan's performance primarily the result of the effective harnessing of fundamental economic forces within the same market capitalist institutions as exist in other advanced economies [..]? Or has Japan crafted new institutions or transformed pre-existing institutions in ways so basic that they bring into question the belief in the inevitable convergence towards single, universally rational form of economic organisation [..]? (Gerlach, 1992:2).

The search for a robust response to the issues such as those posed above has proved hard to develop and has generated much debate. Here, the aim is not to add to the open-ended discussion on what are the critical factors in Japan's success. Rather, it is to point to the functions of some of the underpinning institutions and concepts that combine to form what may arguably be a 'unique' industrial and corporate system.

The firm

Within Japan's industrial and corporate system, the firm, or *kaisha,* represents one of the

three basic forms of industrial organisation (Fruin, 1992). The other two are the factory (see Dore, 1973; Whittaker, 1990) and the interfirm network (see Gerlach, 1992; Fruin, 1992). The manner in which these three elements are aligned and interact constitutes one the underlying characteristics of the Japanese industrial system. Abegglen & Stalk (1985) describe at length the structure and behavioural characteristics of the 'typical' large Japanese firm, while Yuzawa (1994) presents a simple comparison of the characteristics of a generic Japanese firm with those of the a generic 'Western' (in this case US) model (See Exhibit AI.3).

These characteristics and the managerial systems which are used to enact them are upheld by the 'three pillars' of the Japanese industrial relations system: lifetime employment, *nenko* (seniority plus merit) wages and enterprise unionism (Whittaker, 1990).

The issue of ownership in relation to Japanese firms is one that has received much attention, as it seems to differ markedly from the concept of ownership in relation to Western firms. The complexity of ownership of Japanese firms is summarised by Abegglen & Stalk (1985) as follows:-

> [..] the shareholder in the *kaisha* is in the position of investor, but is in no operational sense in control of the company. With adequate return on investment, the shareholder's role is largely ended. Furthermore, it is no longer useful nor accurate to view the *kaisha* as being under the thumb of their banks, soliciting borrowings and deferring to bank judgements on decisions. The successful *kaisha* are as free from bank control as are their Western counterparts. Finally, describing the *kaisha* as group members and thereby under some form of control that membership is of limited value. Those *kaisha* that have led the post-war international competitive thrust are generally separate from Japan's traditional groupings of companies[384], and operate independently (Abegglen & Stalk, 1985:191).

	Japan	**US**
Aim of the company	Long-term marginal value	Short-term profits
Capital	Mainly loan	Mainly reserved
Company ownership	Employers and employees	Shareholders

[384] See later section on the role of vertical and horizontal groupings, or keiretsu. Here, Abegglen & Stark are referring to the groupings which have emerged from the pre-World War II *zaibatsu*.

Shareholding pattern	Stable (reciprocal)	Fluctuating (seeking high return)
Strategy	Growth-oriented	Profit-oriented
Division of profit	For reserves initially	For dividends initially
President	Representative of all employees	Representative of shareholders
Trade union	Single union	Functionally organised plural unions
Decision-making	Bottom-up	Top-down
Education	On-the-job training	Off-the-job training
Worker	Plural jobs, general	Single job, specific
Employment	Lifetime	Contract
Wage, promotion	By years of service	By ability

Exhibit AI.3 Comparison between Japanese and US corporate characteristics
Source: Yuzawa (1994:15)

While much the attention of the literature is focused upon the large firms, the small and medium sized enterprises (SMEs) form a large part of the Japanese industrial and corporate system. The post-war growth of the Japanese economy has lead to an uneven expansion of two sectors of the economy, the so-called 'dual structure' (Sasaki, 1990). The first sector is that of large firms, and the second that of SMEs. The first feature of this dual economy that is readily apparent upon examination of the relevant data is that Japan's economy is dominated by small firms: almost 97% of Japanese manufacturing companies have less than 100 employees (See Exhibit AI.4).

A second feature of this 'dual structure' economy is the high productivity of the big firms.(See Exhibit AI.5).

In terms of manufacturing organisations, the Japanese corporate and industrial system is thus dominated by a large number of SMEs who have low productivity, and a relatively small number of large firms with high productivity.

Number of employees	**1966**	**1970**	**1976**	**1980**	**1981**	**1984**	**1986**
1-9	72.8	73.4	76	76	57.5	56.7	56.7
10-19	13.7	13.6	11.5	11.3	20.2	20.1	20

20-99	11.3	10.6	10.5	10.8	18.9	19.7	19.7
100-299	1.6	1.8	1.5	1.4	2.4	2.6	2.7
300-999	0.5	0.5	0.4	0.4	0.7	0.7	0.7
1000+	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Total number of firms	594,832	652,931	727,427	734,623	436,463	428,998	436,004

Exhibit AI.4 Size distribution of manufacturing establishments (by percentage)
Source: Sasaki, 1990:20

Number of employees	**1966**	**1970**	**1972**	**1978**	**1981**	**1986**
1-3	23	22				
4-9	35	36	34*	33*	35	35
10-19	46	46	48	47	44	43
20-99	53	54	54	54	50	50
100-299	68	67	69	72	67	67
300+	100	100	100	100	100	100

Exhibit AI.5 Value added productivity differentials by size of enterprise
Source: Sasaki, 1990:20
***Figures for 1972 & 1978 refer to firms with 1-9 employees**

Interfirm networks and industrial groupings

An often described feature of the Japanese industrial and corporate system is the role of links, ties and networks that join Japanese firms. This is discussed in length by Gerlach (1992) who points to five 'defining tendencies' of these relationships between Japanese firms and how these differ from those linking companies in the West:-

1. *Affiliation ties*. Transactions often take place through alliances among affiliated enterprises, creating a vast sphere of life intermediate between anonymous markers and vertically integrated firms.
2. *Long-term relationships*. Intercorporate relationships in their ideal form are stable and long-term, relying on diffuse sets of obligations extending over time.
3. *Mulitplexity*. Transactions tend to be overlapping, with equity investment and personal interlinks used to consolidate financial, commercial and other business ties.
4. *Extended networks*. Bilateral relationships are set in the context of a broader family of related companies.

5. *Symbolic signification*. Active efforts are made to infuse intercorporate relationships with symbolic importance, even in the absence of formal, legal arrangements or contracts (Gerlach, 1992:4).

These interfirm links are most evident within the Japanese industrial and corporate system when formalised into identifiable industrial groupings, or *keiretsu*. The *keiretsu* play a key role in defining the Japanese business environment, yet companies belonging to *keiretsu* account for only one-tenth of 1% of all incorporated business in Japan (though group members tend to be larger than the average Japanese firm (Kester, 1991)).

The typical *keiretsu* structure is characterised by three features (Ohsono, 1995). Firstly, there are the bonds of cross-shareholding, of around 3-5%, between members. Secondly, there is shared access to capital through a member bank, as well as other shared services, such as distribution and shipping. Thirdly, there is the vertical integration within industries and sectors. The *keiretsu* members are not merely subsidiaries of holding companies, and their guidance comes from the 'co-ordinating' role of the regular meetings of the top management of member firms (Miyashita & Russel, 1994; Ohsono, 1995). The *keiretsu* can also be categorised as being either horizontal or vertical (See Exhibit AI.6). The horizontal *keiretsu* members tend to be grouped around a central bank, and represent the development of Japan's pre-war historically important groups of companies, the *zaibatsu* (Abegglen & Stalk, 1985), whereas the vertical *keiretsu* members tend to be constructed in a pyramid form under a large central manufacturing firm.

These relationships provide the member firms with access to reliable sources of loan capital, a core of long-term and patient shareholders, and may also provide a partially internalised market for intermediate products.

Type	***Characteristics***	***Examples***
Horizontal	Common ties to a powerful bank. Core companies will typically include trading company, insurance companies and key manufacturing companies	Mitsui, Mitsubishi, Sumitomo, Fuyo, Sanwa, Daiichi-Kangyo (These are known as the 'Big Six")
Vertical	Large manufacturing company at the 'top' of the pyramid, with hundreds of smaller companies	Toyota, Nissan, Honda, Matsushita, Hitachi, Toshiba, Sony.

	below. Overlaps with horizontal keiretsu as many of the large vertical keiretsu lie within borders of 'Big Six'.	

Exhibit AI.6 Vertical & horizontal *keiretsu*
Source: Miyashita & Russell, 1994

These relationships differ from the networks of strategic alliances increasingly found in high tech industrial environment in the West in a number of ways. Most fundamentally, strategic alliances create a framework upon which a relationship is constructed for the purposes of some specific project outcome, and the underlying relationship between the two firms involved will not alter the core integrity of each organisation. In *keiretsu* arrangements the situation is somewhat different:-

> Japan's major business groups [..] comprise direct and indirect linkages among banks, industrial firms and commercial enterprises that shape a complex web of interests affecting the company as a whole. They engage in a wide variety of activities by opening up sources of capital flows between banks and corporate borrowers, setting a framework for the exchange of raw materials and intermediate product trade and providing a forum for the information exchange of information. Most importantly, they define, though patterns of share cross holding and business linked equity investment, the underlying ownership structures of their participants - those actors who are assigned ultimate control over the basic decision making apparatus of the company through the formal mechanism of corporate control (Gerlach, 1992:8).

The strongest distinction between *keiretsu* groupings and the Western alliance networks can be seen as follows: in the case of alliance networks, the relationship will not actually alter the integrity of ownership of the participating organisations, whereas for *keiretsu* arrangements, ownership structure will change.

Corporate governance

The key factors which differentiate the system of corporate governance that has evolved in Japan from the system underpinning the functioning of Western corporations are described in Kester (1991):-

1. *Heavy reliance upon reciprocity in equity ownership and commercial trade.*

   If the business relationships lasts long enough and becomes close enough, the trading firms can become virtual extensions of one another in a vertical or horizontal production and distribution system, though without some of the management control problems that plague large corporations integrated under a single corporate hierarchy. Since the relationship is arm's-length and equity

ownership is restricted to minority positions, market incentives are preserved and bureaucratic disabilities held to a minimum (*Ibid.,* 61).

2. *Use of flexible 'implicit' contracts founded upon trust.*

Trust and implicit contracting is engendered in several ways. Japanese ethnic homogeneity is certainly one factor. Well-defined and widely adhered to social and religious norms regarding obligations to others makes it easier to form reliable expectations about the behaviour of counterparts in an exchange relationship. The virtual absence of significant non-Japanese stakeholders in Japanese corporations creates a cultural homogenous business community inside Japan (*Ibid.,* 64).

3. *Selective intervention by major equity-owning stakeholders to correct problems before they become insurmountable.*

Perhaps the most important safeguard [in ensuring the effective functioning of the system of corporate governance] is the ability of one or more major share-owning stakeholders to intervene when necessary to resolve conflicts in the coalition or to turn around a company's deteriorating performance. Usually the intervening stakeholder will be the company's main bank, although it might be a large trading company or a major industrial firm constituting the core of an industrial group (*Ibid.,* 69).

4. *Alignment of managerial incentives toward growth and away from wealth transfers among stake holders.*

[..] the bias of Japanese corporations toward growth preceded the war and has extended well beyond the period of reconstruction and the realisation of modern economies of scale. This suggests a wider role for growth as a proxy for value maximisation. [..] Managers might pro-actively seek to secure their firms position by investing heavily in those assets that they have a special expertise in managing, even to the point of expanding beyond the point justified by profit maximisation considerations. Alternatively, by pursuing unrelated diversification strategies, some managers may create highly complex organisations that perhaps only they can understand well enough to mange effectively (*Ibid.,* 75).

The role of government

The 'visible hand' is an image has been used to describe the relationship between business and government in Japan. There is considerable controversy as to how much of a role the government has played in Japan's post war success, and how much it continues to play. The two extremes of this controversy are summed up by the following two passages:-

[..] it is the special and unique way in which the Japanese government has guided the economy's development and the interaction of government and enterprise which has been the hall mark of the Japanese economy (Kaplan, 1972, as quoted in McMillan, 1985:43).

At the other end of the spectrum, there is the following view:-

> Careful examination of Japan's post-war trade and industrial development in comparison with general performance world performance indicates that the Japanese pattern was not unique as all; thus while government policy may have been important, its impact on economic performance was not 'uniquely Japanese' (Patrick & Rosovsky, 1976, as quoted in McMillan, 1985:43).

Such confusion in viewing the impact of Japanese government intervention on past performance is mirrored in identifying the actual role of the government in the contemporary industrial and corporate system. Useful summaries of the relationship between private and public sector, the role of government intervention, and the use of the various 'targeting polices' are provided by Miwa (1996: Part III), Fruin (1992, Chapter 2), Sasaki (1990, Chapter 5) and McMillan (1985, Chapter 3).

Conclusions

The intricate nature of Japan's corporate and industrial system merits a much deeper description than space permits here. The purpose of this section has been to highlight the features of the basic components of this system (the firm, the interfirm network, the system of corporate governance and the role of government) and to point towards the relevant literature which provides a greater level of detail for each of these areas.

Appendix II Sources of data for the case studies

The two main sources of material which provide the rich contextual evidence for the building of the case studies can be grouped as *primary* and *secondary* sources. Primary sources relate to those providing material specifically for the present programme of research, whereas secondary refers to sources of data collected for another purpose and kept archived in some form (Stewart & Kammins, 1984).

Primary sources

The primary material for this research was obtained through the use of semi-structured interviews with individuals from the case study companies and their competitors, as well as financiers and journalists. The basic structure of the interviews was broadly the same for each interview, and was built around the format shown in Exhibit AII.1[385]. The individuals listed in Exhibit AII.2 were interviewed to provide either the material for the building of the case studies, or the developing of an understanding of trends within the IT industry. While some were willing to be taped and to have their comments quoted, others requested that direct quotes not be included in this thesis. Their wishes have been complied with.

Secondary sources

The secondary sources of material for the rich contextual evidence required for the case studies included: company reports[386], previously published case studies, industry reports (from private sector sources, e.g., *DataQuest*, and public sector sources, e.g., JETRO), and news archives (e.g., *'Reuter Business Briefing'*, *'FT Profile'*). The specific publications selected within the news archives are listed in Exhibit AII.3. The titles of the actual news articles used are listed in the main bibliography.

---

[385] With the exception of those interviews carried out in 1993, where the aim was to build an understanding of the 'big picture' with respect to the strategy of Japanese firms in the IT industry.

[386] In addition, the *FT Extel* and *FAME* company data archives provided background material for certain financial figures not available from the companies themselves.

Basic interview structure for internal sources

- Interviewee background (present position, career path).
- Perception of trends within IT industry and position of interviewee's firm with respect to those trends.
- Present relationship with parent/subsidiary.
- History of relationship.
- Benefits of relationship.
- Areas of concern.
- Impact of relationship on future strategies.

Basic interview structure for external sources

- Interviewee background (present position, career path).
- Perception of industry trends.
- Perception of relationship between parent and subsidiary of case study firm(s).
- Perception of background to the relationship.
- Perceived benefits of relationship.
- Perceived problem areas.
- Perceived impact of relationship on future strategies.

Exhibit AII.1 Format of case study interviews

Key informants

[**Name,** *Position*, Company (Interview location), Interview date]

- **Adachi**, Motomitsu, *Senior Researcher*, Fujitsu Laboratories (Japan), 19/8/93.
- **Aida**, Motohisa, *Business Development Manager, ICL Business Group*, Fujitsu (Japan), 14/3/96.
- **Akao**, Yukitoshi, *Manager*, Nikko Bank (UK), 27/5/96.
- **Davison**, John, *Director, Interactive Services*, ICL (UK), 28/2/96.
- **Godfrey**, Simon, *OEM Manager*, Kao Infosystems (UK), 25/4/96.
- **Goto**, Daisuke, *Manager, Strategic Planning Department*, Mitsubishi Electric Corporation (Japan), 15/3/96.
- **Goto**, Takashi, *Deputy General Manager, Strategic Planning Department*, Mitsubishi Electric Corporation (Japan), 15/3/96.
- **Hasegawa**, Junichi, *Deputy Foreign Editor*, Yomiuri Shimbun (Japan), 17/8/93.
- **Hines**, Richard, *Managing Director*, Elco Europe (UK), 23/5/94.
- **Horne**, Peter, *Group Managing Director*, Mitsubishi Electric PC Division (UK), 20/2/96.
- **Hurley**, William, *Manager, Mergers & Acquisitions*, Industrial Bank of Japan (UK), 16/11/95.
- **Hyugaji**, Akira, *Engineering Manager, R&D Group*, NEC Corporation (Japan), 16/8/93.
- **Imamura**, Tetsuya, *Board Member* & *General Manager*, Kao Corporation (Japan), 18/3/96.
- **Ishiguro**, Atsuyoshi, *General Manager, Technology Affairs*, Mitsubishi Corporation (Japan), 18/8/93.
- **Ishii**, Akira, *Senior Co-ordinator, 3DO Planning Department*, Matsushita Electric Industrial (Japan), 23/8/93.
- **Ishioka**, Sachio, *Head of R&D Office and International Relations*, Hitachi (Japan), 17/8/93.
- **Kitazato**, Koshiro, *Director*, ICL (UK), Fujitsu (Japan), 11/1/95 & 14/3/96.
- **Matsuoka**, Toshio, *Former Director*, Matsushita Electric Industrial (Japan), 12/3/96.

- **Matsuura**, Yasunari, *Manager, Corporate Finance, Japan Desk*., Coopers and Lybrand (UK), 26/2/96.
- **Molakola**, Srikanth, *Associate, Corporate Development Services*, Nikko Securities (Japan), 14/3/96.
- **Nakamura**, Hideyo, *Manager, New Product Development*, Kao Infosystems (UK), 19/12/94 & 18/4/96.
- **O'Toole**, Thomas, *Staff Writer*, Nikkei Weekly (Japan), 18/8/93.
- **Sawai**, Hiko, *Deputy Group Managing Director*, Mitsubishi Electric PC Division (UK), 20/2/96.
- **Shigiya**, Tomoko, *Manager, Corporate Advisory Department*, Kleinwort Benson (UK), 6/11/95.
- **Shimpo**, Ichiro, *Director, Business Development Centre*, Matsushita Electric Industrial (Japan), 23/8/93.
- **Takeda**, Yukio, *Manager, R&D Planning*, Fujitsu Laboratories (Japan), 19/8/93.
- **Takigami**, Shinji, *Manager, Corporate Development Services*, Nikko Securities (Japan), 14/3/96.
- **Tosh**, Malcolm, *Operations Manager*, Kao Infosystems (UK), 18/4/96.
- **Watanabe**, Hideo, *Director*, ICL (UK), Fujitsu (Japan), 16/11/95.
- **Yoshizawa**, Masamitsu, *Assistant Manager, Technology Affairs*, Mitsubishi Corporation (Japan), 18/8/93.
- **Yurino**, Toshio, *Senior Manager, ICL Business Group*, Fujitsu (Japan), 14/3/96.

Exhibit AII.2 Key informants

- *APT Data Group*
- *Asahi News Service*
- *Associated Press*
- *FTBR Technology*
- *Investor's Business Daily*
- *Investor's Chronicle*

- *Birmingham Post*
- *Business Computing News*
- *Business Week*
- *Chief Executive*
- *Communications Week International*
- *Computer Weekly*
- *Computergram International*
- *Computerworld*
- *Computing*
- *Daily Express*
- *DataQuest*
- *Edge Internet Access*
- *Educom*
- *Electronics Weekly*
- *Extel*
- *Financial Weekly*
- *Lloyds List*
- *McCarthy Company & Industry Information*
- *McGraw-Hill Computing & Telecom*
- *Newsbytes*
- *Newsweek International*
- *Nihon Keizai Shimbun (Nikkei)*
- *Nikkei Business*
- *Nikkei Weekly*
- *PR Newswire*
- *Reuter News Service*
- *The Economist*
- *The Guardian*
- *The Independent*
- *Upside*
- *Wall Street Journal*
- *Which Computer?*

Exhibit AII.3 Key publications used as secondary data sources

Note: A number of the secondary sources listed above are actually combined archives, e.g., McCarthy Company and Industry Information includes a wide range of specialised publications.

Appendix III Case study company information[387]

Fujitsu

Communication Systems

Digital switching systems, carrier transmission equipment, optical fibre systems, optical submarine cable transmission systems, multiplex radio communication equipment, satellite communication equipment, telephones, corporate information network systems, communication application systems, mobile communication systems, software, network consulting services, network integration services and maintenance services.

Computers and information processing systems

Supercomputers, general-purpose computers, business servers, workstations, personal computers, financial terminal equipment, PoS systems, medical systems, communications controllers, disk drives, magnetic tape units, hand-held terminals, printers, word processors, fax machines, software, system consulting services, system integration services, outsourcing services, VAN services, maintenance services.

Electronic Devices

Logic ICs, microcomputers, analogue ICs, hybrid ICs, memory ICs, compound semiconductors, relays, connectors, keyboards, plasma display units, liquid crystal displays.

ICL

Systems and services

Retail IT solutions (services, hardware, software, systems management), systems and services to financial sector, systems and services to central and local government, utilities etc., systems and service consultancy, outsourcing business, facilities management, provision of multivendor hardware and software products.

Hardware

Assembly of PCs and servers (now managed by Fujitsu), contract manufacturing.

Mitsubishi Electric

Space Development

Satellite and communication systems and equipment, satellite systems and subsystems.

[387] All data drawn from company reports.

Communication and Information-Processing Systems

Information network systems and equipment, radar and guidance systems, mobile telephone communication systems and equipment, facsimile machines, computers, peripherals: flexible-disk drives and printers.

Electronic devices

Semiconductors: ICs, LSIs, VLSIs, power semiconductor devices, optical semiconductor devices, transistors and diodes.

Energy

Generators: steam turbine, hydroturbine, diesel, motor and high frequency AC and DC types, nuclear power equipment, substations: transformers, rectifiers, circuit breakers, gas insulated sub-stations, switchgear, surge arresters, control centres, controllers, un-interruptible power supplies, modular and mobile-type substations.

Transportation

Electric propulsion equipment: traction motors, main drive gears, traction-control gears, main transformers, rectifiers, main alternators and VVVF inverters, electric locomotives, rail-system auxiliary electrical equipment, automatic train-control equipment, train air-conditioning equipment, electronic automotive equipment, car audio and information systems.

Building equipment and systems

Elevators, escalators, moving walks, building management systems, services modules for buildings, air-conditioning, ventilating and refrigerating equipment.

Industrial and Factory Automation Equipment

Electrical-discharge machines, laser processing machines, computerised numerical controllers, programmable logic controllers, AC drives and robotics, circuit breakers, magnetic contactors and starters, timers, electrical measurement devices and transformers, induction motors, electromagnetic clutches and brakes, industrial sewing machines.

Visual information equipment

Colour and projection TVs, VCRs and home theatre systems, 'Diamond Vision' mammoth display systems, multi-screen projection systems, display monitors, CRTs and TFT LCDs.

Home electronics

Air conditioning and heating systems, kitchen appliances, laundry and cleaning appliances.

Apricot

PCs

High performance multimedia and business-use PCs.

Network servers

Severs for workgroups, small office and departmental use.

OEM products

PC motherboard production.

Kao

Personal care and cosmetics

Cosmetics, soaps, facial cleaners, body cleansers, skin care products (including Nivea-Kao range), hair care products, oral care products.

Laundry and cleaning

Laundry detergents, laundry additives, household cleaning products and deodorisers, dishwashing detergents.

Hygiene and bath additives

Granular and other bath additives, nappies, sanitary products.

Fatty chemicals and edible oils

Various raw materials for industrial markets including palm oil, palm kernel oil and fatty alcohols.

Speciality chemicals

Environment-friendly cleaning agents for electronics industry, antistatic additives, fragrances, concrete additives.

Food products

Edible oils, cake mixes.

IT products

Production of floppy disks, MO disks, DAT and CD-ROMs, value-added user services including software duplication, packaging and customer support. Recent moved into direct electronic software distribution.